

# EXHIBIT

## 13

1 DEPOSITION OF JOSEPH ANTOGNINI, M.D.

2 JANUARY 28, 2022

3  
4  
5 IN THE UNITED STATES DISTRICT COURT  
6 MIDDLE DISTRICT OF TENNESSEE  
7 NASHVILLE DIVISION

8 TERRY LYNN KING,

)

9 )

10 Plaintiff,

)

11 )

12 Vs.

)

No. 3:18-cv-01234

13 )

14 TONY PARKER, et al.,

)

15 )

16 Defendants.

)

17 )

18 APPEARANCES:

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S T I P U L A T I O N

The deposition of JOSEPH ANTOGNINI,  
M.D., called as a witness at the instance of the  
Defendants, taken pursuant to all rules applicable to  
the Tennessee Rules of Civil Procedure by agreement on  
the 28th day of January, 2022, before Missy Davis,  
Notary Public in and for Knox County and the State of  
Tennessee pursuant to stipulation of counsel.

It being agreed that Missy Davis may  
report the deposition in machine shorthand, afterwards  
reducing the same to typewriting.

All objections except as to the form  
of the questions are reserved to on or before the  
hearing.

It being further agreed that all  
formalities as to notice, caption, certificate,  
transmission, et cetera. The reading of the completed  
deposition by the witness and the signature of the  
witness are expressly waived.

1 JOSEPH ANTOGNINI, M.D.,  
2 having first been duly sworn, was examined and deposed  
3 as follows: The witness,

4 VIDEO OPERATOR: Good morning. We  
5 are going on the record at 9:01 a.m. on  
6 January 28th, 2022. This is media unit number  
7 1 of the video recorded deposition of  
8 Dr. Joseph Antognini in the case of Terry Lynn  
9 King versus Tony Parker, et al., filed in the  
10 United States District Court, Middle District  
11 of Tennessee, Nashville Division, case number  
12 3:18-cv-01234. This deposition is being held  
13 remotely via Zoom. Will counsel please  
14 identify themselves for the record?

15 MR. KURSMAN: My name is Alex Kursman  
16 and I am counsel for Terry King. Along here  
17 with me on this Zoom is Sarah Miller, Jeremy  
18 Gunn, Ana Baldridge, Hayden Nelson-Major, David  
19 Esquivel. Aaron Sommer is in my office with me  
20 as well.

21 MR. ATYIA: My name is Dean Atyia. I  
22 am counsel for the defendants. It looks like  
23 here with me are Scott Sutherland, Connie  
24 Blandon, Rob Mitchell, Miranda Jones, and  
25 Mallory Shuler.

1 VIDEO OPERATOR: Okay. If there's no  
2 one else, will the court reporter please swear  
3 in the witness.

4 (Thereupon, the witness was sworn.)

5 MR. ATYIA: Alex, I'm sorry, I meant  
6 to mention this a moment ago. I just wanted to  
7 get something on the record and make sure it's  
8 okay with you. I am admitted to the Middle  
9 District, have not filed my Notice of  
10 Appearance because I've spoken to the Clerk's  
11 Office and they are in the process of setting  
12 up my CMECF. I'm hopeful that will be done  
13 today and I can file that today, but I don't  
14 know for sure. So if you're okay with that, I  
15 think we can proceed.

16 MR. KURSMAN: Yeah, we have no  
17 objection to that if you are planning to enter  
18 your appearance.

19 MR. ATYIA: Yes, I am. Thank you,  
20 Alex.

21 COURT REPORTER: Excuse me. Can I  
22 get the spelling of your last name, Dean?

23 MR. ATYIA: Yes, ma'am. My last name  
24 is Atyia, A-t-y-i-a.

25 COURT REPORTER: Thank you.

1 EXAMINATION BY MR. KURSMAN:

2 Q. Good morning, Dr. Antognini.

3 A. Good morning, sir.

4 Q. My name is Alex Kursman and I'm an  
5 attorney with the Federal Community Defender Office in  
6 Philadelphia. And I'm acting on behalf of plaintiff  
7 Terry King in King vs. Parker pending in the Middle  
8 District of Tennessee. Do you understand that you're  
9 here today to answer questions related to the King  
10 case?

11 A. Yes.

12 Q. And what is your understanding of  
13 what this case is about?

14 A. My understanding is that the  
15 plaintiffs, I guess the inmates, are challenging the  
16 lethal injection protocol that is used by the State of  
17 Tennessee and I'm here to provide expert testimony on  
18 behalf of the State.

19 Q. And have you reviewed the entire  
20 Tennessee lethal injection protocol?

21 A. I have not recently, but I have  
22 reviewed it, yes.

23 Q. And what is your position on the  
24 death penalty?

25 A. Well, that could -- I'll try to give

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1       you an executive summary of that. I have some  
2       conflicting views on the death penalty for religious  
3       reasons and for reasons of, you know, I think one of  
4       the worst things that a government or a state can do is  
5       to execute an innocent person, so I have certainly  
6       concerns about the possibility that there are people  
7       that either are on death row who are innocent or people  
8       that have been executed who are innocent. So I  
9       certainly do struggle with that.

10               On the religious perspective, there's  
11       clearly a difference of opinion especially depending on  
12       your religion. I'm a Catholic and even in the Catholic  
13       Church, there is a division about the death penalty.  
14       And so, personally, I think that there are instances  
15       where the death penalty would be appropriate and those  
16       instances might differ from somebody else who has  
17       different criteria. So I think my sort of funneling  
18       point of all this is that I just let the democratic  
19       process work its way out and if a state decides that  
20       they're going to have the death penalty, then that's  
21       their choice. And if a state decides they don't want  
22       to have a death penalty, that's their choice.

23               And so I basically am not -- I have  
24       some misgivings about the death penalty, I'll put it  
25       that way, so I think to say that you're against the



1 death penalty, let's say in all instances, I'm not sure  
2 that I could say I'm against the death penalty in all  
3 instances.

4 Q. And how many death penalty cases,  
5 lethal injection cases have you testified in?

6 A. I would have to refer to my report  
7 where I specify that. I would say -- now, some of the  
8 cases, for example, as you know I did work in Ohio and  
9 testified in Ohio. I've testified in Arkansas. And  
10 I've been to Ohio maybe three times, Arkansas twice. I  
11 don't know whether they're the same case or not, if  
12 that's what you mean. Inmates come and go on these  
13 cases, so I don't know exactly how to answer that  
14 question in terms of numbers, but I can --

15 Q. It's over five, though, right?

16 A. Oh, yeah, obviously, yes, correct.

17 Q. And you've probably worked with over,  
18 you know, seven or eight states?

19 A. Probably. I would have to look at my  
20 report and all that, but, yeah, that might be about  
21 right.

22 Q. And I'm not holding you to these  
23 answers. And the federal government, too, you've  
24 worked for them?

25 A. That is correct. I was an expert

1 witness on behalf of the federal government.

2 Q. Why do you think you became the go-to  
3 guy for these lethal injection cases?

4 A. Well, that story began about -- at  
5 least my perspective on it, about six years ago. Let's  
6 see, early 2016. So, yeah, six years ago. I was  
7 contacted by -- there's a medical legal company called  
8 Elite Medical and they basically find doctors who are  
9 willing to do medical legal work. And I was contacted  
10 by them to provide some expert testimony on behalf of  
11 a -- it was a patient that had died at a hospital here  
12 in California as a result of -- primarily as the result  
13 of a midazolam overdose and they asked me for -- I  
14 don't know how they got my name, but they asked me to  
15 provide testimony for the State. I'm sorry, for the --  
16 I was actually testifying on behalf of the hospital  
17 because the State would essentially fine the hospital  
18 because of this and so I was testifying on behalf of  
19 the hospital. And this was an administrative case.

20 And then within a couple of months  
21 after that work, I got a call from Elite saying there's  
22 a state that wants to try to find a witness for lethal  
23 injection and it was Mississippi and they asked if I  
24 was interested in doing that. And I said, well, let me  
25 look at it, and so I ended up doing that. And then

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1 just over time, different states would contact me and  
2 ask would you be willing to provide some testimony or  
3 expert witness testimony for that state. So that just  
4 sort of -- I think once my name got out there, I was  
5 contacted by other states.

6 Q. Have you ever said no to a state?

7 A. I have said no in the sense that I  
8 did not provide any expert -- you know, like a report  
9 or anything like that.

10 Q. Why?

11 A. I would not --

12 MR. ATYIA: All right. I'm going to  
13 voice an objection here. I think to the extent  
14 he has served as a testifying expert, he's  
15 required to disclose that. I think beyond  
16 that, it's his privileged information.

17 MR. KURSMAN: We're in a deposition,  
18 though, so he can answer this question.

19 Q. Why?

20 A. I'm sorry, sir, you're asking me?

21 MR. ATYIA: I'm sorry, Alex, hold on.  
22 If it's --

23 MR. KURSMAN: Are you making a  
24 privilege objection right now?

25 MR. ATYIA: Well, what I'm trying to

1           understand is I believe that it -- I don't  
2           believe it's our privilege. But if he was a  
3           consulting expert or some other type of expert  
4           for a state and had communications with that  
5           state in that capacity, I don't know that  
6           that's discoverable. So I'm going to reserve  
7           that objection and let him -- he can go ahead  
8           and keep answering, but I think we're getting  
9           on the boundaries of expert discovery here.

10          Q.           So why did you not work as an expert  
11          for that state?

12          A.           It was a -- just sort of timing issue  
13          in my personal and professional life that I didn't have  
14          the time or the interest, I suppose, to pursue it.

15          Q.           Have you ever told a state that their  
16          protocol wasn't -- you didn't think it was adequate?

17                       MR. ATYIA: I'm again going to  
18          object. I think, Alex, we have to specify if  
19          it's in a report that he's provided or in his  
20          capacity as a testifying expert. His  
21          consultancies I don't believe are discoverable.

22                       MR. KURSMAN: Are you making a  
23          privilege objection?

24                       MR. ATYIA: It's not my privilege,  
25          but I would appreciate you re-wording the

1 question so that it adheres to the bounds of  
2 expert discovery.

3 MR. KURSMAN: Court Reporter, could  
4 you read back the question?

5 COURT REPORTER: Sorry, I'm working  
6 with a loaner right and I'm trying to figure  
7 out how to get back.

8 MR. KURSMAN: You know what? It's  
9 okay.

10 COURT REPORTER: Oh, okay. Go ahead.

11 Q. Has there ever been a lethal  
12 injection protocol that you have been shown by a state  
13 where you told the state you didn't think that protocol  
14 was adequate?

15 MR. ATYIA: Same objection.

16 A. I have, to my knowledge -- and I'll  
17 explain my answer. I've never told a state that it's  
18 inadequate or adequate. I don't make those kinds of  
19 opinions. States contact me and they say here's the  
20 protocol.

21 Q. Have you ever --

22 A. I'm not done with my answer. Here's  
23 the protocol. And I review the protocol and I say, you  
24 know, these are the expected outcomes, in my opinion,  
25 of what would happen if you follow this protocol. And

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1       then I tell a state, if you decide what you want to do  
2       with that information, you can leave the protocol in  
3       place, you can change the protocol, whatever you want  
4       to do. But I don't advise the states and tell them  
5       that, you know, this is inadequate, because -- and I --  
6       well, I'll just leave it at that. I don't use terms  
7       like that. I don't -- like I say, these are -- in my  
8       opinion, these are the expected outcomes and you decide  
9       what you want to do with that.

10               Q.           Has a state ever asked you, do you  
11       think our protocol will cause the inmate pain?

12                       MR. ATYIA: I've got to object again.  
13       If he's had communications with states as an  
14       expert, I don't -- I guess, again, it's not our  
15       privilege, but I think you know, Alex, that  
16       those are protected communications. What's at  
17       issue is what he's testified to as a testifying  
18       expert.

19                       MR. KURSMAN: Is this a privilege  
20       objection?

21                       MR. ATYIA: Again, I don't -- it's  
22       not my privilege to assert. I think you're  
23       asking questions that are under privilege.

24               Q.           Has a state ever asked you whether a  
25       protocol could cause an inmate pain?

1           A.           I suppose in -- you know, I'm going  
2 back through my memory here about, you know, what  
3 states have asked me specifically. And I'm sure in  
4 those kinds of questions they have asked would this  
5 protocol cause pain. You know, I'm not sure it's  
6 exactly the way that you've worded it, but in -- I  
7 think their questions in that regard have been, you  
8 know, pretty close to the way that your question is  
9 worded. Now, I am of the opinion that all the  
10 protocols basically, you know, there's going to be  
11 some amount of pain no matter what in lethal injection  
12 because you have to start an IV, so, you know, the  
13 lethal injection protocol is not completely painless  
14 because at the very least you have to start an IV.

15           Q.           Do you think some of the protocols  
16 that you've seen will cause more pain than others?

17           A.           So when you say some of the  
18 protocols, are you talking about lethal injection  
19 protocols or just all protocols that I've --

20           Q.           Lethal injection protocols.

21           A.           Lethal injection protocols. And I'm  
22 sorry, repeat the question about the pain.

23           Q.           Out of all of the lethal injection  
24 protocols that you've seen, do you think some of those  
25 lethal injection protocols will cause the inmate more

1 pain than others?

2 A. The ones that I have seen, I do  
3 not believe that one would cause more pain than the  
4 other. It's within the bounds of my -- of, you know,  
5 obviously, trying to measure pain is somewhat  
6 subjective, of course, but in my opinion that  
7 the amount of pain which is, I believe, to be  
8 essentially zero with these lethal injection protocols,  
9 then -- to answer the question, then the amount of pain  
10 would be the same for all of them, which is zero as far  
11 as outside of starting the IV.

12 Q. Okay. So I know we've sort of gotten  
13 started, but I just want to go over some ground rules  
14 before we get into the meat of the deposition. I know  
15 you've taken your deposition several times before. How  
16 many times have you taken a deposition?

17 A. I have been deposed for, you know,  
18 medical malpractice, not me personally as a defendant,  
19 so I'm not going to count those. I think you mean for  
20 lethal injection and so forth, but for --

21 Q. No, no, I actually mean ever.

22 A. Oh, okay. I'm sorry. Maybe five,  
23 six, seven times, my guess. I would have to go back  
24 because I actually haven't done -- I have not done a  
25 lot of depositions. I've done more testimony I think



1       than I've done depositions.

2                   Q.           And how many depositions have you  
3       done in the lethal injection context?

4                   A.           Maybe three.   This would be the third  
5       one maybe.   Yeah.   And just as a side bar, having done  
6       this now for six years, I've been surprised a little  
7       bit about why I've not been deposed.   It's usually I  
8       just go straight to the testimony in court.   So it's  
9       not been very often actually, as far as I can recall.

10                  Q.           And then the three depositions for  
11       lethal injection, which cases were those, if you  
12       remember?

13                  A.           Yeah.   Well, this one, as I said,  
14       this is the -- and then there was -- I was deposed  
15       in -- for the Oklahoma case.   That was about a year  
16       ago.   Yeah, it might be -- this might just be the  
17       second one, now I think about it.   I'm thinking back  
18       about it.   Maybe, I think, Oklahoma might have been the  
19       first time, now that I -- and I don't know if I did it  
20       since then up to this point.

21                  Q.           And was Oklahoma also a -- the same  
22       three-drug protocol?

23                  A.           Yes.   It's three drug.   I don't know  
24       what -- I think the doses are about the same.  
25       Certainly the midazolam doses are the same.

1 Q. Did you also do a deposition in  
2 Arkansas?

3 A. I don't think so. I thought -- I  
4 think Arkansas was all basically trial testimony. I  
5 don't know that I actually was deposed. If I was, you  
6 know, I don't remember it. But I don't think I was  
7 deposed in Arkansas, but I could be wrong about that.

8 Q. And do you remember anything  
9 different about the Oklahoma protocol than about the  
10 Tennessee protocol?

11 A. I believe that there are differences  
12 in -- let me see. It seems to me that one of them, and  
13 I'm sorry, I don't remember all the details, but some  
14 of these protocols have very, very -- I can't say  
15 brief, but some of them are much longer than others. I  
16 can't remember if Tennessee's is longer than Oklahoma's  
17 or Oklahoma is longer than Tennessee's. But there's  
18 more specificity in one versus the other. I'm sorry, I  
19 don't remember which one is which. But at its core, or  
20 at their cores, they're very similar. I think one of  
21 them specifies more about possibly about consciousness  
22 checks and other specific details like that, but I  
23 don't -- I'm sorry, I do not remember which one is  
24 which.

25 Q. And do you think it's important to

1 have more specificity when there -- in the context of a  
2 consciousness check?

3 A. Not necessarily, no. No, I don't  
4 think so.

5 Q. Do you think it's important to have a  
6 medical professional perform a consciousness check?

7 A. Well, medical professional is  
8 certainly a broad term. Lay people could be taught how  
9 to do consciousness checks, so I don't know how much  
10 training is, you know, required for this. But all I  
11 can say is that if lay people can be taught to do  
12 consciousness checks, I think that can be applied to a  
13 broad group of people.

14 Q. So do you think it's important that a  
15 medical professional would be involved in the  
16 consciousness check?

17 A. I don't think it's important, no. I  
18 don't think that it's -- would it be -- I just don't  
19 think that it's critically important by any means.

20 Q. So you think anybody can do it?

21 A. Somebody who is properly trained.

22 Q. And what does that mean, properly  
23 trained, in your opinion?

24 A. Well, as I said, people -- lay people  
25 could be trained to do consciousness checks. That's

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1 part of some of the basic life support and first aid  
2 training and -- now, does that mean you can just take  
3 somebody off the street and give them a one-hour  
4 lecture and then, you know, tell them to do a  
5 consciousness check in the execution chamber? I don't  
6 think that would probably be the best thing  
7 necessarily. But I don't think you need to be a  
8 medical professional. But certainly, experience would  
9 be beneficial, I will say that, having experience in  
10 terms of the general area of medicine and so forth.  
11 So, again, lay people can be taught to do this. I'm  
12 not saying that that's sort of the floor in terms of  
13 what would be required in an execution chamber, but I  
14 would just say that medical professional, again, very  
15 broad term.

16 Q. You're saying lay people who are  
17 trained is not the floor?

18 A. No. I say that, you know, lay people  
19 trained to check, do consciousness checks would  
20 probably not be sufficient if they had no other  
21 experience. Again, if you would grab somebody off the  
22 street and give them a one-hour course to do a  
23 consciousness check and then put them in an execution  
24 chamber and say do a consciousness check on this  
25 individual, then I'm not sure that would be sufficient.

1 Now, again, it's something that lay people can be  
2 trained to do, so, again, it depends on experience and  
3 the type of training that person has received.

4 Q. And what type of training do you  
5 think is necessary?

6 A. Well, if you go to a standard first  
7 aid course or BLS, basic life support course, they  
8 incorporate the -- usually they will incorporate some  
9 type of training to do consciousness checks, so -- I've  
10 not actually developed a curriculum for that, so I  
11 can't really answer beyond that.

12 Q. So all I want to know is what type of  
13 training, because you said you think training a lay  
14 person would be the floor, not training them off the  
15 street in one hour, but training a lay person would be  
16 the floor, so I want to know what type of training you  
17 think would meet that floor standard that you're  
18 talking about.

19 A. Well, again, I have looked at the  
20 curriculum, I guess, of -- for some basic life support  
21 and first aid courses that talk about consciousness  
22 checks and so I think that would be at a bare minimum  
23 what a person would need to understand to be able to do  
24 a consciousness check. I'm not really -- not able to  
25 or want to go into the specific details right here on

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1 the spot because you're talking essentially about  
2 specifics around a curriculum instead of, you know,  
3 basically a curriculum to determine or to be able to do  
4 these consciousness checks, so I just don't -- I'm not  
5 sure I can provide any more details right here on the  
6 spot.

7 Q. Okay. And you said you're -- are you  
8 not able to or you don't want to?

9 A. Well, I think both, I mean, in the  
10 sense that I don't want to because I don't have those  
11 details. So, for example, if you start asking me  
12 questions, well, what scale should be used in terms of  
13 determining consciousness and what -- how many times  
14 should a person -- you know, what length of time should  
15 this be spent teaching this person, details like that,  
16 I cannot provide to you because I haven't thought all  
17 the way through. I defer, again, to the American Red  
18 Cross, who has developed these curricula and others as  
19 far as what is being taught for basic life support. So  
20 I say that I don't want to simply because I don't want  
21 to misspeak and I don't have all those facts readily  
22 available.

23 Q. Did you have those facts when you  
24 were writing your report?

25 A. Well, I certainly reviewed the

1 criteria. I'm sorry, I reviewed the -- I believe it  
2 was the American Red Cross. I cannot remember exactly  
3 in my report what I referred to, but I did refer to the  
4 training of lay people in some of these types of  
5 courses, so --

6 Q. And do you know whether the  
7 individuals who performed the consciousness check in  
8 Tennessee's lethal injection were trained in accordance  
9 with whatever materials you looked at?

10 A. I don't know only in the sense --  
11 first off, I don't know. Secondly, since my report was  
12 just submitted recently whether any training has  
13 occurred subsequent to that or any training occurred  
14 before that, I do not know.

15 Q. Okay. So if in your report you said  
16 that the training was sufficient, are you saying now  
17 you actually don't know whether the training is  
18 sufficient?

19 A. I'm not sure, and certainly you can  
20 correct me if I'm wrong, I'm not sure that I explicitly  
21 stated that the training of the individual in that  
22 protocol is sufficient. I think I might have said that  
23 an individual who is going to be doing the  
24 consciousness check is capable of being trained. I  
25 don't know -- since I don't know the training of the

1 specific individual, I don't think I would have said  
2 that. I could have and that would have been my error.  
3 But I think my statement was more around saying that a  
4 person, as specified in the protocol, is capable of  
5 being trained to do a consciousness check.

6 Q. But just so I understand you  
7 correctly, is it your opinion that so long as a person  
8 is trained in accordance with a first aid consciousness  
9 check they would be able to determine the anesthetic  
10 depth of an inmate subject to lethal injection?

11 A. It is -- again, it's an individual  
12 who is trained with and understands the types of  
13 responses to look for. That individual would be able  
14 to determine whether, for example, there is a response  
15 to a verbal command or to a sternal rub and so forth.  
16 And that would be the same as if the person was a  
17 medical professional or a lay person. So they would be  
18 able to, if properly trained and properly applied, they  
19 would be able to elicit those responses just like a  
20 medical professional.

21 Q. In a hospital setting, nurses and  
22 doctors who determine anesthetic depth, are they only  
23 trained with a first aid definition of consciousness?

24 A. Well --

25 MR. ATYIA: Objection. You're asking



1           if he knows about what hospitals are trained to  
2           do.

3                       MR. KURSMAN: Yes, he's an expert.  
4           But I would appreciate it if you just objected  
5           to form.

6                       MR. ATYIA: Okay. I'm sorry.  
7           Objection to form.

8           A.           Well, as it turns out, as I look back  
9           on my own medical training and experience and so forth  
10          and education, and I think this is true in general for  
11          a lot of physicians and nurses, we may not get explicit  
12          instruction and training to determine levels of  
13          consciousness. It's something that you might pick up  
14          on your own if you did a rotation in the surgery unit  
15          and so forth, you would pick that up. But it's not --  
16          to my knowledge, it's not a required part of the  
17          physician training or the nurses training, again. So  
18          it's possible for a physician or a nurse to go through  
19          their whole training and education and not really pick  
20          up any explicit instruction or material related to  
21          checking consciousness levels.

22                      Q.           When you say it's possible for nurses  
23          or doctors, are you talking about nurses who practice  
24          anesthesiology?

25                      A.           No. I'm just talking about nurses in

1       general.

2                   Q.           But what about nurses who practice  
3       anesthesiology?

4                   A.           Well, nurse anesthetists get training  
5       that is pretty intense, not as intense, of course, as  
6       an anesthesiologist, but certainly there is some fairly  
7       intense and a lot of material, so I would expect that  
8       they would get that type of training to check levels of  
9       consciousness. But, no, as it turns out, you know --  
10      again, looking back at my own career and because I was  
11      a professor of anesthesiology at U.C. Davis and I  
12      trained a lot of residents, I'm not sure that we had  
13      explicit sort of criteria -- not criteria, but explicit  
14      curriculum that everybody got. I could be wrong about  
15      that, because I didn't teach everything to everybody.  
16      But, you know, it's something that you pick up more on,  
17      I suppose, your experience side than in any sort of a  
18      classroom side.

19                  Q.           Can you describe for me how you would  
20      pick that up on the experience side?

21                  A.           Well, if you would -- you take care  
22      of patients all the time that have depressed levels of  
23      consciousness. And I'm not talking about here just  
24      about anesthesiology, but just in medicine in general.  
25      You have people -- you have patients that are going to

Page 25

1 have depressed levels of consciousness and you would  
2 ask them to -- you would have to assess their level of  
3 consciousness. So one thing that you have to  
4 understand about this and doctors in general, if you  
5 want to take -- and this is my opinion in terms of an  
6 estimate. I'm not even sure I can give you a numerical  
7 estimate.

8 If you were to ask them about  
9 different sedation scales or different -- like what's  
10 called the Glasgow coma scale, and ask them to be  
11 specific about that, I think a vast majority of them  
12 would not be able to determine or to use those scales  
13 to be able to determine a level of consciousness  
14 because it's just not part of their training, or  
15 experience, or education. So some people are going to  
16 pick it up based on the types of patients that they  
17 take care of and others won't. So there's a lot of  
18 variability, I guess, across the board in medicine and  
19 nursing in terms of whether you would be able to  
20 determine levels of consciousness.

21 Q. For those people who are able to  
22 determine levels of consciousness, those people who had  
23 the rotations or see those patients, do they get better  
24 over time?

25 MR. ATYIA: Objection to form.

1           A.           Well, I guess in general they would,  
2       yeah. I mean, obviously, if -- I mean, you get better.  
3       I always offer the following caveat, and it applies to  
4       me just like anyone else about an experience and what  
5       you do. And I've said this before when I was teaching  
6       residents, you know, someone will say, oh, well, you  
7       know, I've been doing this for 20 years like this and I  
8       have a lot of experience, I've been doing it for 20  
9       years. And sometimes it's like, well, you've been  
10      doing it for 20 years but you've been doing it wrong  
11      for 20 years. So just because you have experience  
12      doesn't mean that you're doing things the right way.  
13      I'm sorry, that may be a little bit of a side bar to  
14      answer your question. But, you know, yes, you can --  
15      experience does help you learn how to do things, but if  
16      you're learning the wrong thing, doing it the wrong  
17      way, then it's -- obviously, it's still the wrong way.

18           Q.           And in a hospital setting when you're  
19      determining levels of anesthetic depth, are you only  
20      going off of what the nurse anesthetist says when you  
21      have machines monitoring levels of anesthetic depth as  
22      well?

23           A.           So the anesthesiologist or the nurse  
24      anesthetist or what's called the anesthesia assistant,  
25      the person that's at the head of the table there looks

1 at a variety of different signs and criteria. There is  
2 a -- monitors that monitor the electroencephalogram, or  
3 the EEG. So, in general, we use all of those to  
4 monitor the depth of anesthesia. Now, the depth of  
5 anesthesia is not necessarily the same thing as the  
6 depth of consciousness. They primarily go hand in  
7 hand, but, no, we don't look just at the amount of  
8 unconsciousness as our sort of depth of anesthesia. We  
9 have to look at all the other things going on in the  
10 body, especially the cardiovascular system. So  
11 sometimes when we talk about depth of anesthesia, we're  
12 incorporating the effects on the cardiovascular system  
13 and saying, hey, you know, this level here, the blood  
14 pressure is too low so we're going to have to lighten  
15 the anesthetic.

16 Q. So describe for me exactly what signs  
17 you're looking for. You said the EEG, you said the  
18 electroencephalogram.

19 A. The EEG is just the acronym basically  
20 for the electroencephalogram. And there's a variety of  
21 different monitors that are commercially available.  
22 Most people are familiar with the BIS, B-I-S, monitor  
23 that some people use. And that, of course, it's pretty  
24 explicitly just for the depth of the brain, the  
25 anesthetic depth in the brain essentially. But it's

1 not a perfect monitor. No monitor in medicine is  
2 perfect. But we look at the blood pressure, the heart  
3 rate as far as understanding how deep the patient might  
4 be. Again, we're not just focused on the depth of  
5 anesthesia relative to the brain. We're looking at  
6 body-wide and sometimes we have to make decisions that  
7 basically we would have to lower -- we would have to  
8 decrease the anesthetic because of effects on blood  
9 pressure even though the patient might be lightly  
10 anesthetized.

11 Q. I'm not asking about the blood  
12 pressure. I'm only asking about monitoring their level  
13 of anesthetic depth. So you said you also look at  
14 signs and criteria. What types of signs and criteria  
15 are you talking about?

16 A. Well, again, blood pressure, heart  
17 rate, there could be tearing, tear formation. Not very  
18 common. I don't see -- I have not seen that a lot in  
19 my career. If the patient is not -- if there's not a  
20 muscle relaxant on board, we look for patient movement.

21 Q. What does a tear formation show?

22 A. Well, it's a more or less an  
23 autonomic response to certain stimulants, so you start  
24 seeing tear formation in the eyes.

25 Q. So would that mean -- would that

1 signal to you that you would need to increase the level  
2 of anesthetic depth, is that what you mean?

3 A. Not necessarily by itself. If  
4 everything else was okay and I saw tear formation, I  
5 wouldn't increase the anesthetic just because of tear  
6 formation. You have to sort of incorporate everything.

7 Q. Well, what else are you looking for  
8 aside from tear formation?

9 A. Well, as I mentioned, heart rate  
10 response, blood pressure response, the movement  
11 response, so forth. In my practice, I have taken a  
12 more -- I guess a pharmacological approach to this  
13 issue. Let me explain that. So, you know, it's funny  
14 when you think about what an anesthesiologist does and  
15 what we do, we do a lot of monitoring, of course. But  
16 from a patient perspective, the one thing that patients  
17 say basically is I don't want to be awake, almost  
18 across the board, I don't want to be awake. And  
19 wouldn't you know it that of the main effect that we  
20 want to have with these anesthetics, the main thing  
21 that we want to occur, we do not have a good monitor  
22 for. We have a great monitor for a lot of other  
23 things, for the blood pressure, for neuromuscular  
24 function, et cetera, et cetera, but, you know, it  
25 just -- it's the nature of the nervous system that we

1 do not have a good monitor for that.

2 So, I'm sorry, sometimes I digress a  
3 little bit. But we do not have a good monitor for the  
4 depth of anesthesia for the brain and so -- I  
5 apologize, I can't remember exactly what your question  
6 is about, but --

7 Q. No, I think that's what you're  
8 answering. So just so I understand, so you're looking  
9 at a lot of different things, is what you're saying,  
10 right?

11 A. Correct.

12 Q. Okay. And you say you don't have a  
13 good monitor to determine whether the depth of  
14 anesthesia that a patient is under; is that right?

15 A. I believe -- well, maybe I  
16 shouldn't -- I probably shouldn't say, you know, good.  
17 I personally believe that -- now, I'm going back to  
18 where I was. I was talking about pharmacology. Now I  
19 sort of got myself back on track, and I apologize.

20 These drugs, based on the studies  
21 that have been published over the years, these drugs,  
22 especially the inhaled drugs, and also intervenous  
23 drugs, if you look at their effects on consciousness  
24 and recall and so forth, especially, again with the  
25 inhaled drugs, when you achieve a certain level of



1 anesthesia -- I mean, a concentration of a drug, not a  
2 depth of anesthesia, but an actual concentration of the  
3 drug or partial presence of the drug, I believe that  
4 there's virtually no chance that a patient is going to  
5 be awake and aware, so -- sometimes these patients may  
6 have increased blood pressure. They may have heart  
7 rate changes or tearing, these other criteria that I've  
8 talked about. Sometimes I will ignore those. I'll  
9 just say, well, I know that this level of anesthesia,  
10 this amount of anesthetic that is virtually certain  
11 that they will not have memory and they're not aware of  
12 these events. So I don't necessarily give more  
13 anesthetic just because they have had these types of  
14 responses.

15 Q. What anesthetics are you talking  
16 about?

17 A. Well, for example, it could be some  
18 of the inhaled anesthetics such as sevoflurane, which  
19 is spelled s-e-v-o-f-l-u-r-a-n-e, desflurane,  
20 d-e-s-f-l-u-r-a-n-e, isoflurane, i-s-o-f-l-u-r-a-n-e.  
21 And they're kind of ether drugs basically. They're  
22 similar to ether in that sense. And in the -- when I  
23 talk about the pharmacology, I basically say that the  
24 variability among humans is very, very low in terms of  
25 the action of these drugs, so that -- now, if you give

1 a certain amount of this drug -- of these drugs  
2 basically, all humans are going to be affected by that.  
3 So I rely or have relied more on sort of the  
4 pharmacology amount than, you know, some of these  
5 signs. Now, I don't ignore those signs altogether. I  
6 might give an opiate, let's say, if something is  
7 occurring, but I may not do anything.

8 Q. And then you said injectables, too,  
9 right?

10 A. That's correct.

11 Q. What injectables are you talking  
12 about?

13 A. Propofol is probably the one that we  
14 are -- obviously, it's the one that's used mostly here  
15 today. In the past, it would have been maybe  
16 thiopental or -- but primarily thiopental or propofol.  
17 There are also opiates that we can give by infusion  
18 such as fentanyl or something called remifentanil,  
19 r-e-m-i. Something called dexmedetomidine is also used  
20 as an infusion. So those IV drugs are used. The  
21 challenge around that is you can give a certain  
22 infusion rate, but that doesn't tell you what the  
23 actual concentration is in the patient as opposed to  
24 the inhaled drugs that I talked about such as  
25 isoflurane. You can monitor those coming out of the

1       breath, so we have a very good monitor for that. So  
2       it's just easier to be able to know where you are with  
3       those drugs.

4               Q.           Just so I understand. That's  
5       helpful. You're saying with injectables, if you give a  
6       certain amount to patient A and a certain amount to  
7       patient B, the nanograms per milliter in their blood  
8       may not be the same, is that what you're saying?

9               A.           That's correct, yeah.

10              Q.           Why is it different?

11              A.           Well, each person -- let's see. It's  
12       a pretty long pharmacological -- pharmacodynamic and  
13       most pharmacokinetic explanation that I don't think you  
14       would want me to go into because besides putting anyone  
15       to sleep, this would certainly do it, if they haven't  
16       gone to sleep. But when you give --

17                       So I'm going to answer your question  
18       first talking about the isoflurane type of drug that's  
19       inhaled. That drug is basically -- it's a gas, a vapor  
20       that goes into your lungs and then into your  
21       bloodstream. I guess for lack of a better word, the  
22       chemistry of how that -- sort of physics of how that  
23       drug transported in the body and how it gets into the  
24       brain, it's related to what's called the partial  
25       pressure. And so if I gave -- if I took an individual

1 and I gave a certain level of that drug into the lungs,  
2 they would achieve a certain level in their  
3 bloodstream. And I took the next person and did the  
4 same thing, the levels would be very, very close  
5 because it's governed basically by physics, essentially  
6 the movement of those molecules from the lungs into the  
7 blood and into the brain.

8 With the IV drugs, they are different  
9 in the sense that the body -- there's more differences,  
10 I guess, from individual to individual about how  
11 that -- the individuals, how their bodies manage those  
12 drugs and other issues around what's called protein  
13 binding and how the drugs are distributed to various  
14 organs. There are a lot more moving parts and  
15 variability and I -- I may have already confused people  
16 about that. I'm sorry, I'm trying to get as lay person  
17 as I can get, but that's -- there's just a difference  
18 between those types of, you know, IV drugs and the  
19 inhaled drugs.

20 Q. No, I think that was helpful. So you  
21 mentioned that these class of drugs where if a patient  
22 gets enough that you just assume based on  
23 pharmacological principles that they're in this level  
24 of anesthetic depth, whatever that level may be. And  
25 you named inhalation drugs and then you named several

1 classes of IV drugs. Are there any other drugs that  
2 you can think of?

3 A. Well, any IV drug, including  
4 midazolam, including propofol, the opiates, as you  
5 look -- as you increase the infusion of these drugs and  
6 you get into higher levels, in general, you're going to  
7 see patients getting higher levels in their blood as  
8 well. And so in a sense, you are -- you could use a  
9 pharmacological or pharmacokinetic approach where  
10 you're saying once I get to this level here, you know,  
11 99.9 percent of patients will be anesthetized at same.

12 I guess what I'm trying to get across  
13 here and I'm not doing a very good job, I think, is  
14 that the amount of variability essentially within a  
15 patient and across patients is less with the inhaled  
16 drugs as compared to the IV drugs. But once you get  
17 high enough doses of the IV drugs, it doesn't matter,  
18 even though there's still going to be some variability,  
19 you still have achieved such a high level that, you  
20 know, everybody is going to be anesthetized or  
21 everybody is going to, you know, have the end effect  
22 that you want.

23 Q. So I want to go back to this everyone  
24 will be anesthetized and let's take out the inhalation  
25 drugs for a second. So, initially, you said inhalation

1 drugs and IV drugs and the drugs that you mentioned  
2 when you're in the hospital are propofol. I think you  
3 mentioned some barbiturates and you mentioned something  
4 else. Is there any other drugs aside from those when  
5 you give those drugs to a patient you can safely assume  
6 that that patient is now under a level of general  
7 anesthesia?

8 MR. ATYIA: Objection to form. Alex,  
9 sorry, we're in agreement I can just say form  
10 and that encompasses everything?

11 MR. KURSMAN: Yes.

12 MR. ATYIA: Okay.

13 A. Are there any other drugs? You know,  
14 that's sort of a broad catch there. So all the -- to  
15 my knowledge, all the IV drugs that we use in the  
16 operating room, and in fact, all the -- for the most  
17 part, almost all IV drugs I would imagine have that  
18 type of variability and not just ones that would induce  
19 general anesthesia. They're just -- there is a  
20 significant amount of variability from patient to  
21 patient.

22 Q. So maybe my question, I think -- I  
23 think my question is confusing. So I'm not asking  
24 about variability. All I'm asking about is, you said  
25 there are a certain number of drugs that when given

1 enough to a patient, you can safely assume no matter  
2 what the monitor says, you can safely assume that they  
3 are under a level of general anesthesia, and you named  
4 barbiturates, you named propofol. I'm asking is there  
5 any other drugs where you can safely assume if you've  
6 given enough that a patient is under general  
7 anesthesia?

8 A. Well, obviously, I believe that's  
9 true with midazolam and with certainly some of the  
10 older -- you know, older anesthetic drugs we don't use  
11 anymore, including some of the older barbiturates.

12 Q. So is that true for all  
13 benzodiazepines?

14 MR. ATYIA: Can we just give him a  
15 second. I didn't know if he was finished. Can  
16 you just make sure to pause and let him make  
17 sure he's finished?

18 A. Yeah. Again, I would have to go back  
19 and look to see if, you know -- and I want to make sure  
20 I'm making myself clear about this distinction I've  
21 made between inhaled anesthetics and IV drugs and this  
22 variability issue. Again, it has to do with you look  
23 at the concentration of the drug or partial pressure of  
24 the drug and you compare it to what effect does that  
25 have on a population of patients. And at a certain

1 level, you say, okay, at this concentration of this  
2 particular drug, a hundred percent of patients are  
3 unconscious and have no awareness, or have no memory,  
4 or whatever it is. And that's a very narrow window.  
5 That is, you go from one concentration to a slightly  
6 higher one and all of a sudden, you know, you've gone  
7 from maybe only ten percent of patients being  
8 unconscious to a hundred percent of the patients being  
9 unconscious. See, that step increase is very small,  
10 relatively small.

11                   Whereas with the IV drugs, you  
12 don't -- you can't do that in small steps necessarily.  
13 That is, small steps, you know, you increase the  
14 percent of patients that become unconscious, but you  
15 have to really get into high concentrations to get a  
16 hundred percent sure that everybody would be  
17 unconscious. That's why when I say with the inhaled  
18 drugs, I know that if I get high enough, at this point,  
19 a hundred percent of patients would be unconscious.  
20 Whereas with IV drugs, as I get in higher levels, I may  
21 not feel that comfortable until I get into really high  
22 levels.

23                   Q.           Because you want to -- just so I'm  
24 clear. Because you want to make sure there's a certain  
25 nanogram per milliliter of blood of that drug in their



1 system, is that what you're saying?

2 A. Yeah, I guess that would be one way  
3 of putting it. I'm not saying that -- you know, we're  
4 not measuring that nanogram level in a patient.

5 Q. Sure, because you can't at that time.

6 A. No, no. It's not -- yeah, that's  
7 correct.

8 Q. Let me ask you this: What is the --  
9 for midazolam, what would that nanogram per milliliter  
10 be? Because you said there are points up to where a  
11 hundred percent of the patients would be under  
12 anesthesia. For midazolam, what would that nanogram  
13 per milliliter be?

14 A. Well, that actually I don't know the  
15 answer to the question. I'm not sure that those types  
16 of studies have been done. But in some of the studies  
17 that I cited, and specifically with the Glass study,  
18 that was a study from 1997, and pulling this from my  
19 memory, I believe they achieved levels of around -- the  
20 highest may have been 890, 8-9-0, my recollection.  
21 Might have been a little bit -- again, I'm not sure. I  
22 don't know, in other studies with midazolam if a  
23 similar approach has been done where they measured the  
24 actual concentration of the drug. Now, the Glass  
25 study, they did not get down to the lowest level or

1 basically it was -- the lowest level being if there was  
2 no response to painful stimulus. And other studies,  
3 benzodiazepines have been shown to be able to achieve a  
4 lack of response essentially to the painful stimulants.  
5 But in those studies, I don't think that they actually  
6 achieved -- or I don't think they actually measured the  
7 concentration of the drug.

8 Q. So you don't know what the  
9 concentration of the drug would be midazolam to achieve  
10 general anesthesia?

11 A. In humans, I don't know that that --  
12 I don't know that. I don't know that that's ever been  
13 actually looked at in terms of the actual concentration  
14 of the drug in the blood.

15 Q. Okay. Do you think there's a number?

16 A. I think there is. I just don't know  
17 if it's ever been measured.

18 Q. So even though it has never been  
19 measured, you in a hospital setting would inject  
20 midazolam into a patient and assume, based on, as you  
21 put it, pharmacological studies, that they were then  
22 under general anesthesia?

23 A. What I have -- first of all, your  
24 question -- first off, midazolam certainly is not used  
25 hardly at all for -- in the current, you know, 2022 as

1 a drug for induction of anesthesia because we have  
2 such -- much better drugs for a variety of different  
3 reasons. But there have been studies and I certainly  
4 have used midazolam for induction of general  
5 anesthesia. But there have been studies that have  
6 looked at the use of midazolam as an induction drug and  
7 midazolam is found to be adequate for that purpose.

8 Q. Right, but that's not what I'm  
9 asking. What I'm asking is, you said a minute ago that  
10 you would assume like propofol, like barbiturates, that  
11 in a hospital setting, if you gave a patient enough  
12 midazolam based on its pharmacological properties that  
13 they would be under general anesthesia. I then asked  
14 you, could you tell me how many nanograms per  
15 milliliter it would take for an individual to be under  
16 general anesthesia with midazolam and you told me I  
17 don't know, I don't know if there are studies; is that  
18 all correct?

19 MR. ATYIA: Objection to form.

20 A. That is correct. But again, I  
21 also -- I don't want you to think that I have -- I use  
22 that pharmacological principle across the board for all  
23 the things that I do for the -- especially for the IV  
24 drugs. So I have to rely in part on what others have  
25 done. And I've cited studies where midazolam has been

1       used for induction of general anesthesia, so I have to  
2       rely on that as well. I don't want you to think or  
3       anyone else to think that I am, you know, using as I  
4       described this pharmacological principles and  
5       pharmacodynamic principles as a sole guide of my use of  
6       these drugs. As I said before, it's more true, I  
7       think, with the inhaled drugs than it is with the IV  
8       drugs.

9               Q.           Right, but I just want to make sure I  
10       understand you because you said with the inhaled drugs,  
11       you actually don't -- you know, sometimes you don't  
12       actually need to look at these other mechanisms or  
13       these other signs because you know if you give them  
14       enough. And you also said with barbiturates that's  
15       true, too, and with propofol. And these drugs are  
16       labeled total anesthetics. And then I asked you if  
17       there are any other drugs and you said, yes, midazolam  
18       based on its pharmacological properties. So now it  
19       seems to me that you're saying, no, midazolam I would  
20       also look at these other signs because I don't know the  
21       nanograms per milliliter; is that right? I'm just  
22       trying to find out what exactly you would you do with  
23       midazolam.

24                       MR. ATYIA: Objection to form.

25               A.           So I would like to answer your

1 question to go back to what I said about in comparison  
2 let's say of propofol to midazolam or barbiturates to  
3 propofol to midazolam and so forth that -- in my  
4 opinion, and again, I'm going to go back, I'm going to  
5 repeat myself, this comparison of inhaled drugs to IV  
6 drugs, in my opinion, the variability is low enough  
7 with inhaled drugs that I feel that once I've achieved  
8 a certain amount of -- a certain level, I feel  
9 comfortable that the patient is adequately -- you know,  
10 is under -- you know, is not going to be aware or  
11 conscious. I don't have that amount of comfort, I  
12 guess, when I'm using an IV drug because of the  
13 variability. And so I would -- whereas I might ignore  
14 some of these signs in a patient anesthetized with  
15 isoflurane, for example, I might give them more weight  
16 in somebody anesthetized with an IV drug.

17 Again, when we do these things we're  
18 not adjusting things solely on the basis of, you know,  
19 is this patient awake or not. We're incorporating  
20 other criteria, you know, the blood pressure and so  
21 forth. So we have to come to a clinical decision  
22 about, you know, what are we going to do. And again,  
23 for the IV drugs, I would focus -- I shouldn't say  
24 focus, but I might give more consideration to some of  
25 these other signs that are occurring.

1 Q. Okay. So for the IV drugs, you would  
2 give more consideration than for the inhaled drugs,  
3 right?

4 A. Possibly, yes, that's true, yes.

5 Q. Okay. Now, how about, would you give  
6 more consideration for propofol than you would for a  
7 barbiturate or would that be the same?

8 A. Well, I'm trying to think of the  
9 context of how -- so first off, we don't use  
10 barbiturates anymore. We've used -- for induction of  
11 general anesthesia. Even when I was in training, we  
12 rarely used barbiturates as an infusion. Whereas with  
13 propofol, we can use it as an infusion, so it's -- I  
14 hate -- I'm not -- I don't -- I guess I don't feel that  
15 comfortable trying to lump barbiturates in with  
16 propofol. I feel more comfortable, you know, just  
17 talking about propofol.

18 Q. Okay. Let's then deal with -- let's  
19 deal with how about midazolam versus propofol. Would  
20 you feel more comfortable ignoring the other signs with  
21 propofol than you would with midazolam?

22 A. So, you have -- again, propofol is a  
23 drug that we can give, infuse, and we can give a  
24 large amount and it will wear off. With midazolam, I  
25 mean, we could do that, but the problem is that it

1 would take a long time to wear off. So it's not -- I'm  
2 just saying, and I think everyone should know this, or  
3 maybe you don't, but, I mean, I've never used midazolam  
4 as an infusion basically for that purpose. I've  
5 always -- you know, I've used midazolam as an injection  
6 for induction of general anesthesia. I have cited the  
7 reports -- or the studies in my reports -- my report in  
8 which midazolam has been used for that purpose and the  
9 dose described there. So I don't -- you know, I'm not  
10 sure I understand. Perhaps you could repeat that  
11 question. I don't think -- I just don't like the  
12 comparison there, I suppose.

13 Q. Let me repeat. Let me ask a  
14 different question first and then I'll repeat that  
15 question. So just so I'm clear, you've never used  
16 midazolam as a solo drug to maintain general  
17 anesthesia, right?

18 A. Yeah, I have not, no.

19 Q. Okay. So would you be more  
20 comfortable ignoring clinical signs when you give a  
21 very large dose of propofol, if you gave a very large  
22 dose of propofol versus if you gave a very large dose  
23 of midazolam when determining a patient's depth of  
24 anesthesia?

25 A. No, I don't think I would ignore one

1       versus the other. With any of the IV drugs like that,  
2       I think that you have to -- in my opinion, you would  
3       have to focus -- again, if we're thinking about, I  
4       guess, consciousness here, you would have to focus more  
5       on some of these signs than you would with the inhaled  
6       anesthetics. And again, just because we have a lot of  
7       good data, I believe, a lot of good data with inhaled  
8       anesthetics with these various end points of  
9       consciousness that we don't really have with some of  
10      the other drugs, so because of that, I feel, I guess, a  
11      little less comfortable ignoring those with IV drugs  
12      than I would with inhaled drugs.

13               Q.           So with all the IV drugs, the  
14      clinical signs should be looked at, is what you're  
15      saying; is that right?

16               A.           In a clinical setting. Now, I guess  
17      when I give you this caveat, which is that there are,  
18      I'm sure, anesthesiologists that -- and I'm not talking  
19      about expert witnesses on the other side, I'm just  
20      talking about anesthesiologists in general who might  
21      claim -- who would disagree with me, you know, even at  
22      this high -- you know, at this level of isoflurane,  
23      let's say, I'm not going to ignore these clinical  
24      signs. But that's just sort of a difference of  
25      clinical -- of management, I think.



1                   Q.            Would they disagree with you with  
2                   these high levels of propofol I can ignore these  
3                   clinical signs?

4                   A.            You know, I think some people that  
5                   would perhaps agree with me and some that would  
6                   disagree. But, again, we're focused, when I say we,  
7                   I'm talking about the anesthesiologists in general, in  
8                   a patient who's anesthetized, for the most part, we are  
9                   focused on -- and this is perhaps an oversimplification  
10                  from what we do, but we're focused on is the patient  
11                  unconscious and what's going on with their blood  
12                  pressure, and usually the breathing is not a problem  
13                  because we're breathing for the patient.

14                                So it's really about are they  
15                  unconscious and what's going on with the blood  
16                  pressure. And we might treat those together or  
17                  separate. It kind of depends. So when I talk about  
18                  these other signs, you know, I may intervene basically  
19                  in terms of controlling the blood pressure in a way  
20                  that, you know, works against the level of  
21                  consciousness issue or vice versa. It just -- it kind  
22                  of depends on the clinical situation.

23                   Q.            Right, but I'm only talking about for  
24                   determining consciousness here. Forget about the  
25                   other -- the other things that you all are monitoring.

1 I'm only talking about consciousness here. There are  
2 other clinical signs -- there are clinical signs that  
3 anesthesiologists and nurse anesthetists look for,  
4 right, when they give anesthetics to determine whether  
5 the patient is unconscious, as you call it, right?

6 A. That is correct, yes.

7 Q. Okay. And you said with inhaled  
8 drugs, sometimes you can ignore those signs because you  
9 know that the patient is under a deep enough level,  
10 anesthetic depth, right?

11 A. Yes.

12 Q. Okay. And you also said there are  
13 times if you give enough injectable drug, there are  
14 times you can ignore those signs; is that right? Or am  
15 I wrong about that?

16 A. I believe you can. Again, it's a  
17 level of confidence. I feel more confident with the  
18 inhaled drugs than I do with the IV drugs.

19 Q. Okay. And then I asked you about the  
20 IV drugs, to name them, and you said propofol and you  
21 named barbiturates, you named thiopental as well,  
22 right?

23 A. Yes.

24 Q. And then at some point you named  
25 midazolam, and I'm asking if you can be as confident

1 with midazolam as you are with propofol?

2 MR. ATYIA: Objection to form.

3 A. I would say probably less confident  
4 with midazolam than with propofol because we have less  
5 data with midazolam. Now, I'm a very data driven  
6 person when it comes to these decisions. And so when  
7 we have less data, I do feel less comfortable with some  
8 of these, you know, what levels we should be achieving  
9 or how much drug we should be giving.

10 Q. So when giving propofol, or  
11 thiopental, or midazolam, to be more comfortable, you  
12 should be looking for the clinical signs as well,  
13 right?

14 A. You would obviously be looking at the  
15 signs no matter what the drug is, but you -- in my  
16 opinion, you would be more concerned about -- you would  
17 have less confidence in the level of anesthesia in  
18 somebody who has been given an IV drug such as  
19 midazolam, or propofol, or a barbiturate. Maybe not so  
20 much the barbiturate perhaps, but, again, that's  
21 something that we don't have a lot of data on. But  
22 from a pharmacological perspective, barbiturates are  
23 similar to propofol. That's sort of an  
24 oversimplification, but basically they're similar in  
25 some respects.

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1 Q. Are you aware of any death penalty  
2 protocols that use inhaled drugs?

3 A. I am not.

4 Q. Okay. And when you talk about the  
5 signs to look for, is there a sign or monitor that you  
6 think is better than others?

7 A. Monitor to look for what?

8 Q. Meaning to look for consciousness.  
9 I'm sorry, that was a poor question. Meaning, you  
10 know, is the -- you described the BIS earlier. Do you  
11 think the BIS is the best monitor you think -- a  
12 consciousness check is the best monitor? In your  
13 expert opinion, what do you think that best monitor is,  
14 if there is one?

15 A. So I will use monitor, monitor to me  
16 in a sense, in and of itself, I think of it as a  
17 machine. But we certainly do use the word monitor in  
18 terms of us looking at the patient. In my opinion, the  
19 data suggests pretty strongly that the BIS is probably  
20 the best monitor for the level of consciousness or the  
21 depth of the anesthetic in the brain.

22 Now, some people disagree with that.  
23 It's not -- certainly not a perfect monitor. I have  
24 used the BIS quite a bit in my career, but it's not a  
25 hundred percent, basically. So if you're going to put

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1 my feet to the fire and say what's the best monitor out  
2 there, it would be the BIS or something -- there are  
3 other types of brain monitors that also work, but I  
4 think the BIS is probably -- they're all more or less,  
5 in my opinion, the data are about the same in terms of  
6 their effectiveness.

7 Q. When using the BIS or these other  
8 monitors, are they monitoring the patient throughout  
9 the duration of the entire surgery?

10 A. They are. Well, let me clarify that  
11 statement. In general, you would want to use it  
12 throughout. Now, some people will put the monitor on  
13 after a patient is asleep and maybe take it off before  
14 they wake up, but in general, I like to -- when I've  
15 used it, I like to have it on before they go to  
16 sleep and then leave it on until they're fully awake,  
17 but practices vary.

18 Q. Why?

19 A. Well, one of the nice things about  
20 the BIS monitor, again, within the context of it's not  
21 perfect, but one of the nice things about the BIS  
22 monitor is that you don't need a control measurement.  
23 That is, if you take -- so the BIS monitor gives you a  
24 number basically between zero and a hundred. And it  
25 arrives at that number through an algorithm and just

1 looks at all the brainwaves and comes up with that  
2 number. And if I were to take the BIS --

3 Let me set up an experiment here for  
4 you or a hypothetical kind of demonstration. If I were  
5 to take you, Mr. Kursman, and I were to put a strip  
6 across your forehead and then gave you an anesthetic  
7 and measured the BIS, your BIS would, you know, maybe  
8 start around 95 and you go down to, let's say, 50 after  
9 I do that.

10 If I had instead anesthetized you and  
11 put the strip on after you're anesthetized, I should  
12 get about 50 on the BIS. So you don't need the control  
13 data basically to be able to arrive at that number.  
14 So, you know, some people say I'm going to induce the  
15 patient, I know these drugs work, you know, they have  
16 the intended effect, I'll just put the BIS monitor  
17 after they're anesthetized just because of, you know,  
18 there are a lot of things happening, it's just, you  
19 know, they don't have enough time to put it on. I like  
20 to put it on because I like to see that effect, but  
21 it's not necessary. And then some people take the  
22 strips off before the patient wakes up. In the past, I  
23 sort of like to leave it on because that's interesting  
24 to me to see those effects, but you don't have to do  
25 that.

1                   Q.           What about after I reach 50, because  
2                   you used me as an example, what about after the patient  
3                   reaches 50? So you put the BIS monitor on, they're at  
4                   90, you give them the drugs, they go down to 50. Would  
5                   it be appropriate to take the BIS monitor off then  
6                   prior to surgery?

7                   A.           No. No, I mean, I don't -- well, I  
8                   don't think appropriate would be the best way. It  
9                   doesn't seem to me that you would have a strong reason  
10                  to remove it. If you're going to measure the BIS,  
11                  you're going to be measuring it throughout the whole  
12                  operation. The amount of anesthetic that you might be  
13                  giving is going to vary, so that's the reason why you  
14                  have the BIS monitor on there, is to measure the  
15                  electroencephalogram, so you want to measure it  
16                  throughout the whole course of the anesthetic and  
17                  surgery. It wouldn't make much sense to me, I guess,  
18                  to put it on and take it off because you've achieved  
19                  that level because it's going to change potentially.  
20                  It almost certainly will change somewhat.

21                 Q.           Why does it change?

22                 A.           Well, there are different levels of  
23                  stimulation. There are different amounts of anesthetic  
24                  that are being given. There are different things that  
25                  are happening to the patient. So you would want to be

1       able to monitor that.

2               Q.           Just so I'm clear, so if a patient --  
3       if the stimulation goes up with a stronger stimulation,  
4       then the BIS will go up and then you'll have to give  
5       more anesthetic, is that what it's about?

6               A.           Yeah, for the most part. I mean, the  
7       BIS number is something that we would incorporate into  
8       our decision about, you know, what to do in terms of  
9       the anesthetic level. It's not the only thing that we  
10      look at, but it's one thing that we would look at.

11              Q.           I know we've been going for while and  
12      you've given me initial admonishments, which I'll do  
13      now, and I know you've taken a lot of depositions, so  
14      you don't really need this, but you understand that  
15      you're under oath, right?

16              A.           Yes.

17              Q.           And you understand that means you  
18      need to tell the truth?

19              A.           Yes.

20              Q.           And is there any reason you can't  
21      testify truthfully or accurately today?

22              A.           There's no reason, except for there  
23      have been -- if something of privileged information  
24      were to come up, then I would have to -- I guess we  
25      would have to work that out. I wouldn't answer

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1       untruthfully. I may just not answer based on that,  
2       so --

3               Q.           You're saying if your attorney  
4       objects and instructs you not to answer?

5               A.           Well, or if I feel as though it's  
6       into an area of where there's attorney-client  
7       privilege, I guess. I don't know. I mean, I think --  
8       I wouldn't wait for an objection, I guess. I might  
9       bring up that issue myself.

10              Q.           Okay. That's fair. Are you taking  
11       any medication today?

12              A.           Am I taking any medication?

13              Q.           Today.

14              A.           Yes. Well, I don't know what --

15                           MR. ATYIA: Let me object here.

16       Alex, this is his health information. I'm not  
17       going to -- if you want to ask him if he's  
18       taking medication that may change his  
19       testimony. Can you respect his health privacy  
20       and do that?

21                           MR. KURSMAN: I think I'm allowed to  
22       ask all that, but it's okay.

23                           MR. ATYIA: Okay. I appreciate that.

24              Q.           Are you taking any medication that  
25       would affect your ability to recall facts today?

1           A.           I don't think so, no. I take  
2 medication for some problems that I have with  
3 essentially migraines, but -- and some other  
4 medications for my cholesterol, so I don't think any of  
5 that is going to affect my ability to answer the  
6 questions.

7           Q.           The medication you're taking won't  
8 affect your ability to give accurate testimony today?

9           A.           I do not believe so, no.

10          Q.           Okay. Does it affect your memory at  
11 all?

12          A.           I do not believe so, no. I don't  
13 think so. I mean, that's something that the --  
14 obviously, maybe if several testing occurred, I don't  
15 know, but I doubt it, so --

16          Q.           And are you represented by counsel  
17 today?

18          A.           I don't know if the -- Mr. Atyia is  
19 representing me. I think I'm here as a consultant, so  
20 I don't have a separate attorney that's representing  
21 me, if I understand your question.

22          Q.           Okay. And I think you've been doing  
23 this a lot already, but just -- you understand that you  
24 have to respond verbally rather than shaking your head?

25          A.           Yes. Hopefully when I shake my head

1 I'm also talking and saying yes or no, something like  
2 that. So, yes, I'm aware of that.

3 Q. And you understand you can't consult  
4 with your -- with Mr. Atyia before you answer any of my  
5 questions?

6 A. That is correct, I understand that.

7 Q. Okay. What did you do to prepare for  
8 this deposition?

9 A. I reviewed the reports by Dr. Van  
10 Norman and Dr. Stevens. I reviewed their deposition  
11 transcripts. And I reviewed my own report. I had some  
12 consultations via telephone or Zoom, I guess. It  
13 wasn't Zoom, I know, it's internet consultations with  
14 the attorneys from Tennessee, like Mr. Atyia and  
15 Mr. Mitchell.

16 Q. Anybody else? I apologize. Who  
17 else?

18 A. Mr. Sutherland was involved in that  
19 as well.

20 Q. How many times did you talk either by  
21 phone or via Zoom?

22 A. So in preparation for the deposition?

23 Q. In preparation for the deposition.

24 A. I would guess maybe four times, give  
25 or take. I mean, there certainly were other phone

1 calls. I might call to say I have a question about  
2 something and all that and that would add -- you know,  
3 that might be another four or five. But they were  
4 usually pretty brief, so I don't -- I'm guessing four.  
5 I could be off by that -- wrong about that, but it's --  
6 it's not like it was ten or 20 or anything like that.  
7 I would say it's probably around four times, you know,  
8 where we spent an hour or two.

9 Q. Well, how long were the meetings?

10 A. Yeah, about an hour or two. I think  
11 the total amount of time my guess was maybe six to  
12 eight hours, is my guess.

13 Q. All in preparation for this  
14 deposition?

15 A. Yes.

16 Q. And was anyone else present at these  
17 meetings?

18 A. I don't think so. I think it was  
19 usually Mr. Atyia, Mr. Mitchell, and Mr. Sutherland.  
20 Sometimes one of them might have gone off to do  
21 something and so it was only two of them. And maybe  
22 there was only one of them, you know, during these,  
23 so -- but nobody else to my knowledge.

24 Q. And did you all review any documents  
25 during the meetings?

1           A.           We reviewed the reports by Dr. Van --  
2       well, let's see. For the actual -- for the preparation  
3       of the deposition, I think we would have -- I think we  
4       reviewed, maybe not in terms of having the actual  
5       document in front us in terms of the Zoom session, but  
6       we would have reviewed the reports by Dr. Stevens and  
7       by Dr. Van Norman. We might have looked at the reports  
8       for Dr. Williams and Blanke, I believe, early on. I  
9       don't think -- I'm not sure that was part of the  
10      deposition preparation that we would have looked at  
11      those, maybe earlier. I don't recall with those. And  
12      then you said other documents. There certainly were  
13      probably some studies that I had cited or maybe Dr. Van  
14      Norman had cited, someone else had cited that we might  
15      have looked at. But that was not a huge part of what  
16      we looked at.

17           Q.           Did you look at any studies that  
18      weren't cited?

19           A.           So the only study that I looked at  
20      that I did not cite but we had talked about in the  
21      deposition discussion that I looked at again after we  
22      finished, and it's a study by -- I can give you the  
23      author's first name. I don't have it in front of me,  
24      but I believe I have the correct spelling of the author  
25      and the citation. The first author's last name is

1 Dhanani, and I'll spell it for you. It's  
2 D-h-a-n-a-n-i. And I'm pretty sure that's the  
3 spelling.

4 That was published in the New England  
5 Journal of Medicine last year. And the nature of the  
6 study and I'm -- despite the fact that I just reviewed  
7 it a few days ago, I might get a little bit of the  
8 facts mixed up here. But essentially what they were  
9 looking at -- these were patients that -- essentially  
10 these patients were, as we colloquially say, they  
11 pulled the plug. These were terminally ill patients  
12 that were going to have withdrawal of life support.  
13 And they were looking at the -- you know, what happens  
14 to the heartbeat basically after withdrawal of the life  
15 support.

16 And what they were primarily  
17 concerned with is how long does it take for the heart  
18 to slow and then stop, and then once the heart stops,  
19 you know -- so let me just stop there, no pun intended.  
20 But certainly, lay people may not quite understand this  
21 and even physicians I think hopefully will understand  
22 this issue about -- if you think about, you know, when  
23 do you know for sure the heart is stopped, right? You  
24 think, well, you know, here's a beat and then there's  
25 no further beats. And you wait a minute and you say,

1       okay, well, after a minute, there's no -- there aren't  
2       any heartbeats, so, you know, the patient is dead,  
3       we're going to turn the monitor off or whatever or pull  
4       the strips off.

5                       What if there was one more beat at a  
6       minute and one second? You would have missed that.  
7       Okay. So this study basically was looking at what  
8       happens to the heartbeat, and it turns out that, you  
9       know, someone could have their heart can stop and then  
10      after two or three minutes, you see another beat. So  
11      the study had to do with when do you actually -- you  
12      feel that you can declare death if you use the  
13      heartbeat as a criteria.

14                     And I was just talking about that  
15      study in relation to declaring death and declaring  
16      death in the execution chamber. So I didn't cite it in  
17      my report, I just brought it up because of this issue  
18      around, you know, when -- you know, the timing of  
19      events in the execution chamber. And so I did look at  
20      that study. I don't know whether it was going to come  
21      up in the context of this deposition, but, you know, it  
22      wasn't part of my report, but I thought about it after  
23      I think I submitted my report and started thinking more  
24      about the issue around the declaration of death.

25                     Q.           And did you review any materials on

1 your own to prepare for the deposition?

2 A. Well, as I said, I looked at the --  
3 yesterday or maybe the day before, I looked at the  
4 trial -- or the deposition transcripts of Dr. Stevens  
5 and Dr. Van Norman and then their reports and my  
6 report. Those are the ones I did on my own.

7 Q. Did anyone consult with you to  
8 prepare for another deposition in this case, meaning --  
9 and what I mean by that is like the warden or the  
10 director, did anybody talk to you before any of their  
11 depositions?

12 A. I don't think so. I don't -- I think  
13 whatever -- the only thing I remember about another  
14 deposition was the warden and it was after the  
15 deposition was given and they said, you know, the  
16 warden said such and such or -- well, I can't remember  
17 the exact conversation, but it was, I think, after the  
18 deposition. It wasn't before.

19 Q. I mean, did you talk to the warden  
20 after the deposition?

21 A. No, no, no, no. This was a  
22 discussion between the attorneys for the State of  
23 Tennessee and me. I didn't -- I have not talked to the  
24 warden. No, I have not talked to the warden, no, nor  
25 anyone else. I've not had any contact with anyone



1 else.

2 MR. ATYIA: I'm sorry, Alex. I'm  
3 going to object to as privileged any  
4 discussions between the State's counsel and  
5 Dr. Antognini other than discussions giving him  
6 information to rely on. You're free to get  
7 into that, but --

8 MR. KURSMAN: Sure. And I don't want  
9 answers on that.

10 Q. My question was going to be, did you  
11 talk to anybody at the Tennessee Department of  
12 Corrections aside from the warden?

13 A. I didn't talk to the warden.

14 Q. I apologize. I just meant aside --  
15 not aside from you talking to him. Did you talk to  
16 anyone at the Tennessee Department of Corrections?

17 A. No.

18 Q. Have you ever talked to anyone at the  
19 Tennessee Department of Corrections?

20 A. I mean, I -- not as far as I recall,  
21 not in relation to this case, and I don't think I would  
22 have talked to them even before that. I don't have a  
23 recollection of ever having any contact. To my  
24 knowledge, I've never had any contact with the people  
25 from the Department of Corrections in any of my cases

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1 -- well, with the exception, I suppose, in some of  
2 the -- maybe in some of the cases that I have been  
3 involved with the general counsel, I guess, the term  
4 general counsel for the Department of Corrections has  
5 been present, but not in this case, as far as I can  
6 recall.

7 Q. And did you review any of the papers  
8 filed in the Court? And what I mean by that is the  
9 complaint by the plaintiffs or anything else?

10 A. I did not do that in preparation for  
11 the deposition. Early on, did I look at the complaint?  
12 That's possible. I don't think so, though. I don't  
13 recall that.

14 Q. And did you discuss this deposition  
15 with anyone aside from your counsel or aside from the  
16 Tennessee Attorney General's Office?

17 A. No.

18 Q. Did you do anything else to prepare  
19 for the deposition aside from what we've already talked  
20 about?

21 A. I'm going to try to give you a -- I'm  
22 giving you a truthful answer, I just -- but it's going  
23 to be full of a lot of questions. It's almost -- it's  
24 quite likely that after one of our depositions, you  
25 know, training sessions -- not training sessions, but

1 one of our deposition discussions session that we had  
2 with the Tennessee attorneys and me, I might have gone  
3 back to an article that I cited, I suppose. I don't  
4 recall if I did what that article was, but it would  
5 have been one that I cited. Like I said, the only one  
6 that comes off the top of my head that I looked at that  
7 I didn't cite was the one I just talked about. I don't  
8 think that I've looked at anything else since -- you  
9 know, during that period.

10 Q. And is eight hours a normal amount of  
11 time that you usually prepare for depositions?

12 A. I would say it's a little bit more  
13 than -- well, first off, like I said, this, I believe,  
14 may only be the second deposition I've given, so --  
15 maybe it's the third, but -- at least in relation to  
16 lethal injection material. So my recollection is I  
17 think I probably spent less time preparing in terms of  
18 a -- sort of a discussion with the attorneys on the  
19 prior deposition compared to this one. It seemed a  
20 little more than the other one.

21 Q. How much money have you made so far  
22 in this case, for your work on this case?

23 A. Without reviewing my invoice  
24 material, I'm going to just have to give you a guess,  
25 which would be -- and of course, I haven't been

1 reimbursed on some of my time yet. So probably  
2 \$10,000.00 to \$15,000.00 maybe. It's a ball park  
3 figure at this point. I'm not sure. It might be more  
4 than that, I don't know.

5 Q. And have you submitted your invoices  
6 yet?

7 A. I believe I have. I'm pretty sure I  
8 have submitted time for Tennessee. Yeah, I'm pretty  
9 sure -- and I might have been paid by them, I don't  
10 know.

11 MR. ATYIA: I'm going to object.  
12 This is -- that's a communication with us that  
13 has -- that's privileged. He doesn't have to  
14 answer that. If you want to ask him about what  
15 he gets paid and things like that, but why is  
16 his submission of invoices involved? I mean,  
17 if you want to get in -- if there's a good  
18 reason, I'll withdraw the privilege.

19 MR. KURSMAN: There is no privilege  
20 to that. But if you're objecting to privilege,  
21 are you instructing him not to answer?

22 MR. ATYIA: No. I mean, if you want  
23 to ask him what he's submitted, go for it.

24 Q. So I think you answered it anyway.  
25 How about in lethal injection cases in general, how

1 much would you say you've made in the last five years?

2 A. I'm not hesitating because I -- you  
3 know, I want to give you an answer. And I -- you know,  
4 obviously there's a -- it's easy for me to look at the  
5 numbers because it's on my tax statements and all that  
6 kind of thing. But it might be close to \$150,000.00  
7 over five years. It might be a little bit more than  
8 that. I haven't -- I'm not sure I've included the  
9 amount -- well, it's now over six years, I guess. I  
10 haven't included the amount that I would have made  
11 recently, so it's probably in that range.

12 Q. And what percentage of your annual  
13 income would that be?

14 A. And I'm not going to answer that.

15 Q. You're in a deposition.

16 A. Well, why do I have to tell you what  
17 my annual -- I mean, you can -- by taking the  
18 \$150,000.00 and then asking what percentage, you can  
19 calculate my annual income and I don't think that's --  
20 you know, what -- maybe I can answer it this way: If  
21 for whatever reason various states decided they didn't  
22 want me anymore and I stopped doing this work, I would  
23 not -- I would be pleased. You know, there have been  
24 many times I've said to myself, you know, why am I  
25 doing this? And I just -- you know, the amount of

1 money that I make on this is not going to affect my  
2 standard of living, so -- anyway. I don't -- you know,  
3 I don't know why that is important to you, I guess. I  
4 guess I can understand it if I need this to survive,  
5 I'll just put it at that. I've been lucky enough and  
6 blessed enough to have a very good income over the  
7 years, have been very frugal, my wife and I, so not  
8 having this income would not affect my standard of  
9 living in any bit.

10 Q. So are you refusing to answer my  
11 question?

12 A. I guess I am, yeah.

13 Q. So you're not going to answer the  
14 question what percent --

15 MR. ATYIA: Objection, form. He's  
16 answered it. He hasn't been instructed. I  
17 think he answered you. You're free to seek  
18 relief --

19 Q. Are you going to answer my question,  
20 what percentage of your annual income has come from  
21 these lethal injection cases in the last five years?

22 A. All right. Now, if you want to be  
23 that much of a stickler about it, you know, I actually  
24 have calculated that over the years and it's probably  
25 around -- you know, I -- all right. It's about

1       ten percent. So now you can do the math obviously. So  
2       thank you very much. You know, people now know  
3       essentially of all my sources of income and like, you  
4       know, whatever. There. You know, people can now do  
5       that calculation over the last several years. So I  
6       think that's just a very rude thing to ask for. I  
7       understand why you're doing it, but I just don't -- I  
8       don't see why that is so important to you that you have  
9       to pull that out of me like that.

10               Q.           So Dr. Antognini, I'm not trying to  
11       be rude and I'm not doing this to be rude. It's for  
12       the same reason that I'm asking --

13                       MR. ATYIA: Let's just ask a  
14       question, Alex.

15               Q.           -- how much money you're -- being  
16       made. One of the responses you said was -- you said a  
17       lot of times you ask yourself why am I even doing this?  
18       Why do you ask yourself that?

19               A.           Well, this exchange is just a great  
20       example, you know. You know, there's a lot of  
21       unpleasantness involved around these types of issues.  
22       And you know, this -- the way that we do things in the  
23       legal system is very adversarial and I just don't --  
24       it's just not very pleasant, can be very unpleasant at  
25       times.

1 Q. So why are you doing this?

2 A. I explain it in the following way for  
3 the most part: I'm going to ask some rhetorical  
4 questions, because I know I'm the one being deposed and  
5 you are not. But suppose I would ask you a question,  
6 do you believe that it's a defendant's right to have  
7 competent representation? And you would say presumably  
8 yes. Do you believe it's a defendant's right to have  
9 availability of an expert witness to testify on his or  
10 her behalf? And you would say yes. I think that's a  
11 fundamental right. Well, in these cases, the  
12 defendant, or in this case, the State of Tennessee or  
13 the people of the State of Tennessee or the State of  
14 Arkansas or Oklahoma, so they are entitled to  
15 representation and expert witnesses.

16 And the nature of these cases is such  
17 that it's very difficult for them to get people to  
18 testify, expert witnesses to testify, so I have taken  
19 that on. And sometimes I think to myself, you know,  
20 why do I continue to do this? So it's just -- it's  
21 very -- it's a very unpleasant process, but I feel  
22 obligated in the sense of the administration of justice  
23 to do this work. But I do it truthfully and offering  
24 my opinions about, you know, what these protocols  
25 involve.

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1                   So, you know, that's the main reason  
2                   why I do it. You hire expert witnesses, the State  
3                   hires expert witnesses, so, you know, that's the basic  
4                   reason. I doubt that there's anybody on this call or  
5                   even for the State of Tennessee that, you know, relish,  
6                   thoroughly enjoy doing this type of work, but, you  
7                   know, here we are.

8                   Q.            Thank you for that, but let's get --  
9                   do you have your report in front of you?

10                  A.            I do not.

11                  Q.            Are you able to pull it up?

12                  A.            I can. It's not on this particular  
13                  computer here, so I would have to get my thumb drive  
14                  and put it in there.

15                  Q.            That's okay. We'll e-mail it to the  
16                  Attorney General's Office right now and they can  
17                  forward that to you. You have access to e-mail, I  
18                  assume, because --

19                  A.            Yes.

20                  Q.            Okay.

21                  MR. ATYIA: Alex, so for sharing  
22                  exhibits, I've told him not to look at anything  
23                  unless you know what he's looking at. So if  
24                  you want to -- however you want to do that, if  
25                  you want to screen share it, whatever. I'm

1 going to screen share.

2 MR. KURSMAN: I'm going to screen  
3 share, but we'll send you the -- your report as  
4 well.

5 MR. ATYIA: Okay. But one other  
6 thing is that for some documents he may need to  
7 look through the entirety of the document.

8 MR. KURSMAN: We can go off the  
9 record if he needs to do that.

10 MR. ATYIA: Okay. Thank you.

11 MR. KURSMAN: Sure.

12 Q. So when you use -- did you receive  
13 your report?

14 A. Oh, right now? I'm sorry. Let me  
15 look and see here. Okay. Hold on just a moment. I  
16 have not. Has it been sent?

17 Q. I'm not sure. Well, you don't  
18 actually have to receive it yet. Let's --

19 MR. ATYIA: I just got it now, Alex.

20 THE WITNESS: So you sent it to me.  
21 I'm sorry, I didn't realize -- okay.

22 MR. ATYIA: If you'll just give us  
23 one second, I'll forward it to him right now.

24 MR. KURSMAN: Okay.

25 Q. Well, what I can do anyway, I can

1 talk to you about your report and I'll screen share,  
2 so -- when you use the term unconsciousness in your  
3 report, what do you mean by that?

4 A. Okay. If I may, do you want me to  
5 look at my report now or do you want me to answer the  
6 question? What's your preference?

7 Q. No, my preference would be for you to  
8 answer the question.

9 A. Okay. Repeat it then.

10 Q. Sure. When you use the term  
11 unconsciousness in your report, what do you mean by  
12 that term?

13 A. So unconsciousness basically, as I  
14 use it there, means that a patient -- so  
15 unconsciousness incorporates two basic phenomena, I  
16 guess, for the lack of a better term, where a patient  
17 is not responsive to various stimuli and they have  
18 decreased or absence of awareness. So let me further  
19 clarify that. Unconscious in terms of a response to  
20 stimuli basically would be that you apply a variety of  
21 different stimuli, including verbal communication, a  
22 tactile stimulation, maybe a painful stimulus, and so  
23 forth, and you look to see if the patient responds or  
24 the person responds. That's sort of the objective  
25 criteria that I would use or a person would use when

1       you're looking at somebody.

2                       But the individual that you're  
3       examining has a subjective component of this -- the  
4       awareness part where they are -- basically have various  
5       levels of awareness, and by awareness I mean that they  
6       are incorporating the stimuli, the environment, and  
7       they have essentially in their mind a representation of  
8       what the world is like around them. And usually the  
9       subjective component, the response to stimuli, goes  
10      hand in hand with the awareness part. Not always,  
11      there's certainly conditions where they're sort of  
12      disconnected, but basically it's a combination of those  
13      two. Now, some people would say that, you know,  
14      awareness and consciousness are completely separate  
15      because, again, one is objective, one is subjective,  
16      and I'm not going to perhaps argue with anyone about  
17      that. I get that understanding. But in general, they  
18      go hand in hand. But, again, there are exceptions to  
19      that.

20                   Q.           So if a patient responds to name  
21      calling, would that fall under your definition of  
22      unconsciousness?

23                   A.           If a person responded to their name,  
24      I would not say that they are -- I would say that they  
25      are still conscious. They may have a depressed level

1 of consciousness, but they would still be conscious, I  
2 think.

3 Q. What if they fail to respond to a  
4 verbal command but they responded to mild prodding,  
5 would they still be conscious?

6 A. I believe that they would be, yes.

7 Q. And what if they fail to respond to  
8 mild prodding but then responded to like a trapezius  
9 squeeze, would they still be conscious?

10 A. I believe you're now getting, in my  
11 opinion, you're getting into the realm of  
12 unconsciousness. Now, you have to understand, and I  
13 didn't make this clear, that the -- you know, we talk  
14 about unconsciousness, consciousness as an all or none  
15 phenomenon, and unfortunately, I certainly fall into  
16 that trap, I guess, where sometimes I use them  
17 basically as -- you know, conscious or unconscious.  
18 But consciousness is really a spectrum, so when you  
19 have somebody who responds only to a trapezius squeeze,  
20 then there are some scientists and physicians who would  
21 say that they are unconscious, others would say, well,  
22 they still have some level of consciousness. So I  
23 think you're getting into the threshold part where --

24 Q. Your report when you use the term  
25 unconsciousness, do you mean that the patient would

1 still respond to a trapezius squeeze?

2 A. No, I don't. Well, they would not  
3 respond to a painful stimulus.

4 Q. Okay. Would that painful stimulus --  
5 or not stimulus, I apologize. Would that painful  
6 stimulus include a trapezius squeeze?

7 A. It could, yes.

8 Q. And how noxious, because you said a  
9 painful stimulus, how noxious of a stimuli would you  
10 say a trapezius squeeze is?

11 A. Well, it's -- if it's applied with,  
12 you know, a strong pinch, it could be quite noxious,  
13 you know.

14 Q. Is it as noxious as surgical stimuli,  
15 would you say?

16 A. No.

17 Q. Okay. So it's not as noxious as  
18 like, say, cutting a person, right?

19 A. It is not. And I base that answer on  
20 the pharmacology -- or pharmacological effects of these  
21 drugs, so -- because you look at how much anesthetic is  
22 required to blunt or to obliterate those types of  
23 responses. You need less for a trapezius squeeze, in  
24 general, you need less anesthetic for a trapezius  
25 squeeze than you would for a surgical incision, which

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1 is less than is required for endotracheal intubation,  
2 so you need more for endotracheal intubation than you  
3 need for surgical stimulation, which is more than you  
4 need for the trapezius squeeze.

5 Q. And would you say a bolus dose of 240  
6 milliequivalents of potassium chloride is more painful  
7 of a stimuli than a trapezius squeeze?

8 A. I do not -- I have an opinion on  
9 that, which is that I believe it is -- one of the  
10 things that's not really come up here very much,  
11 because unfortunately -- as I said to you earlier, I'm  
12 a very data driven person. And of course, you have to  
13 put all the data together. Now, we all agree that  
14 potassium chloride is painful on injection or can be  
15 painful on injection. But I don't know that we have a  
16 good answer to how much -- how painful is 240  
17 milliequivalents of potassium chloride because, first  
18 off, there may -- you may reach a point which giving  
19 more potassium chloride is not any more painful. And  
20 there are certainly studies out there looking at  
21 infusions of potassium chloride which show surprisingly  
22 that some of these infusions in terms of the pain are  
23 similar to the pain of, let's say, the insertion of an  
24 NG tube or something like that, and so -- but that's on  
25 lower doses of potassium. So I don't know that we have

1 good data to say that the infusion of potassium  
2 chloride is more painful than a trapezius squeeze. My  
3 guess would be that it is more painful, but I don't  
4 think it -- it may not be by a lot, I just don't know.

5 Q. You don't have an opinion as to  
6 whether a bolus dose of 240 milliequivalents of  
7 potassium chloride is more painful to an awake person  
8 than a trapezius squeeze?

9 MR. ATYIA: Objection, form.

10 A. I think I -- at the end of my  
11 discussion, I did say I think, in my opinion, it would  
12 be more painful, but I can't give you a number saying  
13 it's 50 percent more painful or anything like that. I  
14 believe that it is more painful.

15 Q. Do you think it would be horribly  
16 painful if given to a fully awake person?

17 A. The pain level would be on a scale of  
18 1 to 10, it would be pretty high. I'm not sure  
19 horribly is the best way of -- you know, the adjective  
20 that you want to use, but, you know, it would be  
21 definitely painful.

22 Q. Would it be close to a 10?

23 A. I don't know. Again, if you look at  
24 the studies of the injection of potassium chloride that  
25 I ever reviewed and I believe were cited in my report,



1       that, you know, some patients describe it as being a 10  
2       out of 10 with potassium infusion and others describe  
3       it as being I think maybe 4 out of 10. I can't  
4       remember the numbers off the top of my head.

5               So, you know, the other thing that we  
6       don't talk about here so much is that the infusion of  
7       the potassium chloride, while initially painful, can  
8       affect the vein in a way that it will basically -- I'm  
9       not sure I'm going to use the right term here, but it  
10      basically stops the nerves from being able to transmit  
11      signal, so it's unclear to me how -- essentially how  
12      long that pain would last. And so I guess it's not  
13      just the question of how painful it is, it's also a  
14      question of how long it will last. And certainly, once  
15      the heart stops and there's no blood flow to the brain  
16      and then -- even in an awake person, the amount of time  
17      it would be painful, you're probably talking about  
18      maybe a total of 20 seconds at most is my guess, again,  
19      dependent on the rate of infusion and so forth.

20             Q.           Are you describing potassium chloride  
21      right now as having analgesic properties?

22             A.           No, I am not.

23             Q.           And when you say --

24             A.           I'm not sure why you would ask -- I'm  
25      not sure why you think that -- if I said something that

1 would even clarify -- what have I said that makes you  
2 think that I described it as having analgesic  
3 properties?

4 Q. You said at some point, the potassium  
5 chloride may stop the nerve signals from sending the  
6 pain up to the brain.

7 A. Yes. If I were to take one of the  
8 nerves in your hand and (inaudible) you would not be  
9 able to send signals from your hand up into your brain.  
10 That's not really considered to be analgesic. That's  
11 the destruction of tissue. Potassium chloride would do  
12 a similar thing where it would destroy the nerve  
13 endings, at least certainly make them not functional.  
14 But I wouldn't describe it as being an analgesic  
15 property at all.

16 Q. I just want to be clear right now.  
17 Are you disputing at all that a bolus dose of 240  
18 milliequivalents of potassium chloride would not be  
19 painful to an awake person?

20 A. No, I'm not disputing that.

21 Q. Okay.

22 A. I'm not -- yeah, your question was,  
23 is it more painful than a trapezius squeeze, which I  
24 answered. I said, yes, I would believe it would be  
25 more painful than a trapezius squeeze. And that in

1       some patients it could be a 10 out of 10. And that  
2       what we don't know is what effect that would have on  
3       the nerve endings and whether those nerves would be  
4       able to transmit pain signals essentially to the brain  
5       after the initial stimulation, which as I said, would  
6       be painful. So putting that all together, I'm not sure  
7       why you would ask -- you know, you would say am I  
8       disputing the actions of potassium chloride in terms of  
9       pain, so I hope I've summarized it enough for you to  
10      understand my position.

11               Q.           You have. Thank you.

12                       MR. KURSMAN: I see that the  
13       videographer is asking for a break. Do you all  
14       mind taking a break right now?

15                       THE WITNESS: It's fine with me.

16                       MR. ATYIA: Alex, whatever you want.

17                       MR. KURSMAN: Okay. Can we go off  
18       the record?

19                       VIDEO OPERATOR: Going off the  
20       record. The time is 10:59.

21                       (Brief recess.)

22                       VIDEO OPERATOR: We're back on the  
23       record. The time is 11:10.

24               Q.           Do you have your report in front of  
25       you now?

1           A.           I did. Give me a moment here to  
2 bring it up. Do I have it in front of me? Yes.

3           Q.           Could you go to paragraph 11?

4           A.           Yes.

5           Q.           I just want to know, here you have  
6 the term deep unconsciousness in the second line.

7           A.           Yes.

8           Q.           Is that different from the way you  
9 use unconsciousness in the rest of your report?

10          A.           I use that term to describe a level  
11 of unconsciousness that I believe would render the -- a  
12 subject incapable of perceiving pain, so deep enough  
13 that they could not perceive pain. That's the way I  
14 use that term or that word.

15          Q.           Deep enough that they could not  
16 perceive?

17          A.           Pain from noxious stimulants.

18          Q.           From any stimuli whatsoever, you're  
19 saying?

20          A.           In my opinion, yes.

21          Q.           And what I'm going to do now is I'm  
22 going to pull up the ASA chart. I will send that to  
23 you as well. But let me see if I -- did that work? Do  
24 you see the --

25          A.           I do see a -- hold on. I do see

1       that, yes.

2               Q.           Okay.   So when you say deep  
3       unconsciousness, where in this ASA chart would that be?

4               A.           Could you make that a little bit  
5       larger?

6               Q.           Oh, yeah.   I apologize.

7               A.           Yeah, that's fine.   There you go.  
8       Now scroll down.   So I would say there would be  
9       under -- well, going back to paragraph 11 as I anchor  
10      on this question here, relative to my use of the word  
11      deep unconsciousness, which I answer the same that deep  
12      enough to not respond to -- not to perceive pain, would  
13      put them under general anesthesia, basically.

14              Q.           Now, I will stop this share.   Can you  
15      see me again?

16              A.           Yes.

17              Q.           And do you have your report still in  
18      front of you?

19              A.           Yes.

20              Q.           The term linear as you use in your  
21      report, what does the term linear mean?

22              A.           Can you show me where I use that  
23      term?

24              Q.           Sure.   Before I show you, could you  
25      define what you believe the term linear to mean?

1           A.           Well, linear is a term obviously  
2     describing a line or a line type of relationship where  
3     the line, you know, either goes up or down. And in  
4     science, basically, you look at the data points to see  
5     whether it -- do the data points fit a line or a  
6     different type of -- you know, maybe a curved line,  
7     such as straight line versus curved line, so -- and you  
8     also have to think about the confidence you have in  
9     terms of saying it's either a linear -- a straight line  
10    or a curved line, basically. And sometimes when you  
11    have data points that are scattered, you may be able to  
12    fit a curved line to those data points or you may be  
13    able -- a linear line. And from a statistical  
14    standpoint, you can't differentiate the two -- you  
15    don't have enough confidence that the linear line is  
16    better than the -- the straight line is better than the  
17    curved line.

18           Q.           Okay. So just so I'm clear, what  
19    you're saying is a linear line is -- means a straight  
20    line, right?

21           A.           Yes, in that context. When I use the  
22    term linear, I'm saying that it's going to be a  
23    straight line for a particular set of data points  
24    within a certain range. So as an example on -- it's  
25    kind of hard to explain this without having sort of a

1 chalkboard in front of me, but on a certain part of  
2 a -- if you have a curved line, you look at certain  
3 data points, you can fit a straight line to that, so it  
4 depends on the -- what data points that you're looking  
5 at.

6 Q. Just so I understand, exponential  
7 line, that would be a curved line, right?

8 A. That's correct, yes.

9 Q. So an exponential line is the  
10 opposite of a linear line?

11 A. I wouldn't say -- opposite is not the  
12 right the word. I'm just saying they're different.

13 Q. Okay. Okay.

14 A. They're different, they're not  
15 opposite.

16 MR. KURSMAN: While we're here, I  
17 just want to mark EXHIBIT 1, which was Dr.  
18 Antognini's report.

19 (Thereupon, the Expert Report of  
20 Joseph F. Antognini, M.D., M.B.A., was marked  
21 and filed as EXHIBIT 1.)

22 MR. KURSMAN: And EXHIBIT 2, which is  
23 the ASA chart that I just showed Dr. Antognini.

24 (Thereupon, the ASA chart was marked  
25 and filed as EXHIBIT 2.)

1 Q. So I think you can close out of your  
2 report for a second, but we'll get back to it. Have  
3 you ever used vecuronium bromide?

4 A. Many times, yes.

5 Q. For what purpose?

6 A. To basically relax muscles. That's  
7 its main effect is to block the transmission of nerve  
8 signals essentially from the nerve to the muscle.

9 Q. And when was the last time you  
10 administered vecuronium bromide on an individual?

11 A. It's hard to say for sure. It's been  
12 years because they switched over to rocuronium, but  
13 vecuronium I might have used within the last ten years,  
14 it's possible I didn't.

15 Q. How about rocuronium, when was the  
16 last time you used rocuronium?

17 A. That would probably be basically  
18 maybe four or five years ago, is my guess.

19 Q. Do you always administer a different  
20 drug before administering vecuronium bromide?

21 A. A different drug? I mean, I don't in  
22 general -- we wouldn't in general administer vecuronium  
23 as the first drug in an awake patient, I guess, so I'm  
24 not sure what you mean.

25 Q. That is my question, if it was



1       unclear. In an awake patient, what would you  
2       administer before vecuronium bromide?

3               A.           In general, you would administer a  
4       drug that is going to produce -- at least produce  
5       sedation or hopefully unconsciousness. Now, I offer  
6       the following caveat, which is that in some emergency  
7       situations, so I'm going to -- and I've said this  
8       before in testimony, in medicine, never say never and  
9       never say always.

10                       So there have been sort of rare  
11       circumstances with somebody who has required emergent  
12       endotracheal intubation for airway protection  
13       essentially where I have given just a muscle relaxant.  
14       I don't know that it was vecuronium, but I didn't give  
15       anything else, and that was because the person's blood  
16       pressure and so forth was, you know, quite low and I  
17       was worried about lowering their blood pressure and  
18       they need to have a breathing tube and I basically have  
19       said to them, sorry, but we have to do this, but I  
20       can't give you any anesthesia and it's stimulating,  
21       but, you know, these drugs might lower your blood  
22       pressure too much. And so I have given vecuronium by  
23       itself to some patients, only a handful at the most in  
24       my career. So I have done that, now that I think about  
25       it.

1 Q. And you've done it, you said, in  
2 emergency situations?

3 A. That is correct, yes.

4 Q. In situations where you're trying to  
5 save a patient's life, I assume?

6 A. Yes, that's correct.

7 Q. And in those emergency situations,  
8 there are times where painful procedures just have to  
9 happen to save a person's life, right?

10 A. Yes, that is correct.

11 Q. And you said at these times, you let  
12 the patient know, you know, I'm sorry, but you're going  
13 to feel this noxious stimuli because this is an  
14 emergency?

15 A. Correct. Generally speaking, that's  
16 what I would say, yes.

17 Q. And how painful is that noxious  
18 stimuli?

19 A. The endotracheal intubation  
20 procedure?

21 Q. The vecuronium bromide without an  
22 anesthetic?

23 A. Well, the -- in awake patients, let's  
24 say we just took a young, healthy person and tried to  
25 do the endotracheal intubation without muscle relaxant,

1 just with nothing, I mean, you can't do it for the most  
2 part. Unless somebody is almost hypnotized, I suppose,  
3 but for the most part, people would not tolerate that.  
4 They would gag and they would basically -- you couldn't  
5 physically do it because they would close their mouth  
6 and it's so stimulating and uncomfortable to do that.  
7 So it is among the most stimulating procedures that we  
8 can do. And if you look at the, you know, in terms of  
9 the anesthetic requirements --

10 Q. I don't mean to cut you off because  
11 I'm just not talking about endotracheal intubation  
12 here. I'm talking about -- I was asking about the  
13 vecuronium bromide or rocuronium. How painful would  
14 just receiving that be?

15 A. Oh, I see. I'm sorry. I thought you  
16 meant in relation to the endotracheal intubation. So,  
17 certainly, we do have fairly good data on people who  
18 have been paralyzed with something like vecuronium and  
19 there are various studies, you know, different  
20 methodologies and, for the most part, it's very -- it's  
21 uncomfortable or even horrifying, it's been described.

22 Now, having said that, interestingly  
23 enough, and I think I mentioned this in my report, is  
24 that, you know, some of these studies, I think this is  
25 a volunteer study. They have volunteers say that they

1 would do it again. I thought, okay, well -- they  
2 describe it some of them as being horrifying, but yet,  
3 some of them would repeat the study. So it is not  
4 something that you would want to subject a patient to  
5 or anybody to if you could avoid it, if you could give  
6 other drugs to try to prevent that, you know, the  
7 consciousness part of it.

8 Q. Will a bolus dose of 100 milligrams  
9 of vecuronium bromide be different -- well, have a  
10 different effect than a clinical dose?

11 A. It would have a faster onset than a  
12 clinical dose, but the end effect basically would be  
13 the same, you would just get there more quickly. And  
14 of course, if you kept the patient alive or the person  
15 alive, it would last longer as well.

16 Q. The vecuronium bromide would last  
17 longer, you say?

18 A. 100 milligrams compared to, you know,  
19 10 milligrams.

20 Q. The person would essentially be  
21 paralyzed longer?

22 A. Correct.

23 Q. Let's say you gave a person 100  
24 milligrams of vecuronium bromide, how long do you think  
25 they would be paralyzed for?

1           A.           Oh, boy. Again, it could be easily a  
2 couple of hours, maybe even longer, I guess, assuming  
3 for the moment that you're keeping the person alive.

4           Q.           Let's say you're not keeping the  
5 person alive.

6           A.           Yeah, okay.

7           Q.           You're giving them 100 -- a bolus of  
8 100 milligrams of vecuronium bromide, how long would  
9 they be paralyzed for and then how long would it take  
10 them to die?

11          A.           Well, 100 milligrams of vecuronium  
12 would have -- achieve what I would describe as complete  
13 paralysis probably within -- again, you know, I have to  
14 look at the data, but my guess would be within 45 to 60  
15 seconds. I mean, that is a huge dose that would have a  
16 fast effect because of the, you know, size of the dose,  
17 so I'm guessing within a minute or -- it's my guess  
18 that you would have complete paralysis. You would  
19 probably, almost certainly would have -- you know, the  
20 individual would feel the effects before that, but  
21 probably within a minute, is my guess.

22                       So let's now talk about, you know,  
23 what happens between that point and the time of death  
24 or when death occurs and the person being unable to  
25 breathe will start to decrease their oxygen levels and

1 will become hypoxic, which means basically their oxygen  
2 levels are getting lower and lower, because they're not  
3 breathing. And then that hypoxia would eventually  
4 cause them to become unconscious because we all need  
5 oxygen to be able to -- for our brains to work.

6 And then effects on the heart or the  
7 heart starts to slow, maybe it goes up initially  
8 because of the stress, but it goes down, eventually the  
9 heart starts to beat irregularly and beat more slowly.  
10 And then the heart stops. And let's assume for the  
11 moment, notwithstanding our discussion earlier about  
12 that paper I had talked about, but let's say the heart  
13 stops and it -- you no longer have any further beats.  
14 So we'll say that's the time of death, when you have  
15 the last heartbeat. That could take, again, from  
16 individual to individual, it might take on average ten,  
17 15 minutes. But in some individuals, depending on  
18 their co-morbidities and so forth, that amount of  
19 hypoxia could result in an arrhythmia that basically  
20 kills them much sooner than that. So in a normal  
21 individual, it might be ten or 15 minutes, but in some  
22 individuals, it might be a lot less if they have  
23 co-morbidities that would make them more susceptible to  
24 hypoxia.

25 Q. So let's go through that in a normal

1 individual. So you said that they would feel the  
2 initial effects at first and it would take somewhere  
3 like 45 to 60 seconds to get the full effect. But what  
4 do you mean by the initial effects at first? Let's  
5 start there.

6 A. Yeah. Well, basically, you feel that  
7 you can't -- you know, you're not able to move your  
8 muscles, that you feel like you're very weak. And so  
9 when you see what we describe as being a partial  
10 paralysis from these drugs, we often use the term they  
11 look like a fish out of water where you just -- and I'm  
12 sorry, I know you admonished me earlier about don't use  
13 any verbal types of -- I'm sorry, any visual signs on  
14 this, but I'll do it visually and then maybe the court  
15 reporter with my help will be able to put this into  
16 words. But basically, you know, a fish out of water.

17 So let me just stand back here where,  
18 you know, you're trying to lift your hand up and, you  
19 know, you can't keep your hand elevated, right? So  
20 you're trying to lift your arm up, whatever, and it  
21 just falls back down onto the table. And that's what  
22 we call a fish out of water, and that's a partial  
23 paralysis. And that will start to occur probably  
24 within -- with that dose, again, patient-dependent, but  
25 it could occur maybe within 30 seconds or so, is my

1 guess. I have to be honest in terms of my review of  
2 the pharmacokinetics and dynamics of these drugs, but I  
3 think with that dose, you certainly would probably see  
4 if not complete paralysis, near complete within a  
5 minute, is my guess, but it might be longer, but  
6 probably not.

7 Q. So at about a minute, we're at full  
8 paralysis. Then you describe at some point that the  
9 patient will begin to suffocate; is that right?

10 A. I did not use the word suffocate.

11 Q. I apologize. What word did you use?

12 A. Well, I just said that they're not  
13 able to breathe so their oxygen level is going to start  
14 to decrease.

15 Q. Okay. And if they are awake, if  
16 you're just giving them the vecuronium bromide, they  
17 will have that feeling of trying to breathe, but not  
18 being able to, right?

19 A. If they're awake, yes, that's  
20 correct.

21 Q. And they would have the feeling of  
22 the air hunger, right?

23 A. Air hunger is one term that is used,  
24 yes. I think that would be an appropriate way of  
25 putting it.



1 Q. At what point do you think that would  
2 be where they start to begin experiencing air hunger,  
3 meaning at what minute?

4 A. I'm sorry, I thought I saw Dean raise  
5 his hand for something.

6 Q. Answer my question before we get to  
7 that.

8 A. Okay. Sure. And your question was  
9 when would they start experiencing air hunger?

10 Q. Yes. I mean, when in your expert  
11 opinion?

12 A. Probably at that dose pretty close to  
13 the dose of the -- at the time when they're fully  
14 paralyzed, because the muscles in the body differ in  
15 terms of their sort of sensitivity to these drugs and  
16 the diaphragm itself is actually a little bit more, as I  
17 recall, a little bit more resistant than other muscles.  
18 But that difference is going to be pretty small at this  
19 dose. So if I say that it's a minute when you're fully  
20 paralyzed, maybe it's a minute and ten seconds when  
21 their diaphragm is fully paralyzed. You know, the  
22 difference there, although there might be one, it's  
23 very slight. I would imagine it's going to be very  
24 slight.

25 MR. KURSMAN: Can we go off the

1 record?

2 VIDEO OPERATOR: Off the record. The  
3 time is 11:30.

4 (Lunch recess.)

5 VIDEO OPERATOR: Going back on the  
6 record. The time is 12:04.

7 Q. Dr. Antognini, we just went on a 30  
8 minute break. During that break, did you talk to  
9 anybody?

10 A. I talked to my wife. You know, I  
11 talked -- not about the deposition, but I locked her  
12 out accidentally and she gave me an earful.

13 Q. Okay. Okay. Hopefully she's back in  
14 there. Before we were leaving or before we took the  
15 break, we were talking about vecuronium bromide and you  
16 were describing the effects of vecuronium bromide upon  
17 an awake person. If that awake person received a 100  
18 milligram bolus dose of vecuronium bromide and  
19 eventually died like you said, what would the cause of  
20 death be?

21 A. Okay. I will answer the question. I  
22 want to clarify an answer you -- to one of my earlier  
23 questions.

24 Q. Go ahead.

25 A. That is the medications that I took

1       this morning. During the break when I went into the  
2       bathroom, I looked at my pills and realized, oh, I  
3       didn't take my medicines today. So during the break, I  
4       did take my medications, so I want you to be aware of  
5       that. I thought I had, but I did not.

6               Q.            Okay.

7               A.            But I have taken them now, so --  
8       okay. So what would be the mechanism of death from the  
9       vecuronium. As I discussed, you know, the low oxygen  
10      level is going to be occurring throughout the body  
11      affecting the various organs, including the heart and  
12      brain, and as I just summarized, I mentioned the brain  
13      will become depressed essentially to the point that the  
14      person would be unconscious. The heart, however, is a  
15      bit more resistant basically in general and the heart  
16      would continue to beat for a while longer until  
17      eventually the heart stops beating, and that would be  
18      the mechanism of death, that the heart stops.  
19      Obviously, you cannot declare death in those types of  
20      circumstances until the heart stops. That's the  
21      usual -- one of the criteria that are used. But you  
22      know, essentially the heart has to stop beating in  
23      order for you to say, okay, the person has died.

24              Q.            And once the vecuronium bromide is  
25      given to an inmate be it a 100 milligram bolus dose,

1 would a consciousness check be possible after they  
2 received the potassium chloride?

3 A. After the potassium chloride or after  
4 the vecuronium?

5 Q. After the vecuronium bromide.

6 A. Yes. After the vecuronium bromide is  
7 administered, a consciousness check would not be able  
8 to elicit any type of response because of the muscles  
9 being paralyzed.

10 Q. Okay. So let's move to potassium  
11 chloride, which is the third drug in the lethal  
12 injection protocol. Have you ever given potassium  
13 chloride to a patient?

14 A. Yes, I have.

15 Q. Can you tell me why?

16 A. Actually, two ways essentially.  
17 Again, this is a bit of an oversimplification.  
18 Actually, I guess, it's more than two ways. But in  
19 normal clinical practice, you would give potassium  
20 chloride in essentially two different ways. One of  
21 them I could discount more or less, which is that one  
22 of the IV fluids that we give to patients is what's  
23 called lactated rings solution. And that actually has  
24 a small amount of potassium in it, but it's not enough  
25 to cause -- you know, patients as far as I know of

1 never described to me that that particular solution is  
2 painful. The electrolytes that are in it are -- at  
3 least the ones that might cause pain are low enough,  
4 such as potassium chloride, that you wouldn't normally  
5 perceive pain. But we use that solution quite a bit,  
6 so -- but, again, it's a pretty low concentration.

7 The other circumstance in which we  
8 would give potassium would be as an actual infusion of  
9 the potassium chloride through the IV for conditions  
10 primarily what's called hypokalemia,  
11 h-y-p-o-k-a-l-e-m-i-a, hypokalemia, which just  
12 basically means a low potassium concentration in the  
13 blood. And because that can have an effect on  
14 primarily the heart, what we would be focused on, it  
15 can have effects elsewhere, but we want to increase the  
16 potassium in the blood, so we would give potassium  
17 chloride for that purpose.

18 Q. What's the maximum amount of  
19 potassium chloride that you have ever given to a  
20 patient?

21 A. Probably maybe 40 milliequivalents,  
22 is my guess.

23 Q. And what dose do you think would be  
24 required for an individual to die from the potassium  
25 chloride?

1           A.           It's a very good question in a sense  
2       it's a -- obviously, understanding the context of  
3       you're serious, you know, what dose would kill  
4       somebody, but just from a physiological and  
5       pharmacological perspective, it's a very interesting  
6       question to work out. And I don't know that we know an  
7       exact answer to that. I can go into the details of why  
8       it's kind of interesting, but, you know, we don't know  
9       for sure the exact dose, I think, that would kill  
10      anybody for --

11                       So let's sort of walk through what  
12      happens when you increase the potassium concentration  
13      in the blood. As you get into higher and higher levels  
14      of potassium chloride in the -- or potassium in the  
15      blood, you know, instead of being let's say around 4,  
16      you go over the 5 and 6 and 7, you start to -- you can  
17      begin to see effects on the heart rhythm and actually  
18      going into what's called ventricular tachycardia or  
19      even ventricular fibrillation, and both of those,  
20      especially the ventricular fibrillation are lethal  
21      heart rhythms. And that amount of -- or that level of  
22      potassium in the blood that would cause that is going  
23      to vary from individual to individual.

24                       So let's assume for the moment that  
25      it's 10 milliequivalents per liter -- or 10

1 milliequivalents basically a concentration in the  
2 blood, and that's the level. How much do you need to  
3 give intravenously in order to achieve that level? It  
4 depends on how fast you give it and it depends on  
5 the amount. So if you gave a small dose or bolus of  
6 the potassium, but you gave it rapidly and that sort of  
7 bolus of the drug went through the bloodstream into the  
8 heart and into the lungs and back into the heart, you  
9 may momentarily achieve a concentration that is  
10 sufficient to stop the heart. If you gave that same  
11 dose more slowly, you might not achieve a high enough  
12 concentration to be able to stop the heart. So there  
13 are a lot of factors that are involved about what dose  
14 might be fatal. I mean -- so it's -- for obvious  
15 reasons, no one has ever -- certainly, no one has ever  
16 studied this in humans.

17 Q. That makes sense. A bolus dose,  
18 though, of 240 milliequivalents, that will cause death,  
19 right?

20 A. Yes, that's my opinion. As it turns  
21 out, I do have some I would call qualitative experience  
22 with this in animals. So I did a lot of animal work  
23 and I used goats as my model. And goats, as it turns  
24 out, are on average about the same size as a human more  
25 or less, 50, 60, 70 kilograms. And at the end of these

1 experiments, I would have to -- we would basically  
2 euthanize the animal, they're anesthetized, so these  
3 are not awake animals, they're anesthetized. And  
4 generally speaking, what we would do as part of that  
5 protocol, we would inject concentrated potassium  
6 chloride.

7 And at the time we were doing this, I  
8 never really thought too much about, well, how much  
9 potassium chloride am I injecting. But subsequent to  
10 my starting to do this work with these protocols, I  
11 sort of thought, well, let me go back and think about,  
12 you know, how much drug was I injecting, how much  
13 potassium chloride was I injecting. And I think, based  
14 on my recollection and my calculations, it turned out  
15 to be around 240 milliequivalents. I mean, it wasn't  
16 exactly that, but just the amount -- when you look, I  
17 think, the concentration of the potassium in a  
18 saturated solution of potassium chloride which is what  
19 we use in the volume, I think it turned out to be that.  
20 And when you inject that intravenously, the heart  
21 stopped probably within five to ten seconds, it seemed  
22 like. It was very, very fast.

23 Q. In a goat, you're saying?

24 A. In a goat, yeah.

25 Q. How long after an inmate receives 240



1 milliequivalents of potassium chloride do you believe  
2 that they will die?

3 A. My guess, based on the -- my  
4 understanding of how fast the injection would go, my  
5 guess, it would probably stop the heart within 30 to 60  
6 seconds, is my guess. But I don't know. I mean, I  
7 guess -- you know, some of these hearts -- again, I'm  
8 basing some of my experience on some of my animal  
9 studies because I don't -- you know, for obvious  
10 reasons, we don't really have that in humans. That is  
11 a very difficult question to answer because, again, it  
12 depends on the rapidity or how fast it's being given  
13 and so forth, so --

14 Q. If it's given like it's given in a  
15 protocol, just a fast injection, bolus dose of 240  
16 milliequivalents?

17 A. I would say probably within 30 to 60  
18 seconds, is my guess. Again, we have to be a little  
19 bit -- at least I think I have to be careful about, you  
20 know, when does death occur. So this is an issue that  
21 I think is -- you know, at least in my mind, is  
22 something that's come up is that if you go into an  
23 execution chamber, if you're looking at a protocol or  
24 an execution in one state, what criteria do they use to  
25 declare death compared to another state? And you might

1 think, oh, it should be the same. Well, I don't know.  
2 I mean, it's -- the death is declared by the --  
3 presumably by a physician there and I don't know what  
4 criteria one physician would use in one state compared  
5 to a criteria used in another state, so maybe --

6 Q. I'm not trying to trick you up here  
7 at all. If you want to define your definition of death  
8 first and then you can talk about the 30, 60 seconds  
9 what you mean by death.

10 A. Yeah, sure. So, again, yeah, I feel  
11 like I need to elaborate a little more about it  
12 because, again, it gets down to the timing of things.  
13 Suppose you give the potassium chloride and the heart  
14 stops. And just basically, there's a beat and there's  
15 no more beat, there's not a beat to follow. And you  
16 wait a minute and the physician comes in, examines the  
17 inmate, and says, you know, the inmate is dead. So  
18 let's say that the heart -- the last heartbeat is at  
19 10:15. Let's pick a number, 10:15. And then at 10:16,  
20 there's no heartbeat, the physician comes in and  
21 declares the inmate dead at 10:16. That's the time of  
22 death, 10:16.

23 But maybe in another state a  
24 physician is a little bit more conservative and says  
25 I'm going to wait two minutes. So at 10:15 we see the

1 last heartbeat, they come in at 10:17, examine the  
2 inmate, and said, you know, now the time of death is  
3 10:17, even though in both instances the last heartbeat  
4 was at 10:15. So that's why these timing issues about  
5 when is the time of death, I'm kind of giving you the  
6 context here about why it depends a bit on criteria.

7 Q. Sure. So let's forget about when the  
8 doctor comes in and just talk about that last heartbeat  
9 that you're talking about, like not when they're  
10 declared dead by the physician, but when their heart  
11 stops and they are dead, right? Let's talk about that.  
12 So if an inmate received a 500 milligram bolus dose of  
13 midazolam and then was followed by 240 milliequivalents  
14 of potassium chloride, how long after the 240  
15 milliequivalents of potassium chloride do you believe  
16 the inmate would be dead?

17 A. So there's no vecuronium being given?

18 Q. There's no vecuronium.

19 A. Okay. So midazolam and then the --  
20 so the inmate, I believe, would be dead in general, in  
21 general --

22 Q. Yes.

23 A. The inmate, the last heartbeat would  
24 probably be about 30 to 60 seconds after the injection  
25 of the potassium chloride. And I'm kind of hedging,

1       waffling, hedging my bets here because I'm a little bit  
2       not sure about -- now, when we talk about these issues,  
3       we sometimes talk about, you know, the injection of  
4       this drug. Well, are we talking about the beginning of  
5       the injection, are we talking about when it's all fully  
6       injected?

7               Q.           Sorry, and I apologize. Let's say  
8       Tennessee, and this will be very simple math, okay?  
9       Let's say Tennessee took one minute to inject the 500  
10      milligrams of midazolam. So you're at one minute.  
11      Then the warden waited two minutes to do the  
12      consciousness check. One minute to inject the  
13      potassium chloride immediately after the consciousness  
14      check, so that's four minutes. How long after that do  
15      you think the inmate would be dead?

16             A.           Probably by minute five, you know, I  
17      would say by minute five. You know, it might be four  
18      minutes and 30 seconds or five minutes, but somewhere  
19      around minute five is -- you know, is my guess.

20             Q.           Now, let's say that that same  
21      scenario where Tennessee took one minute to inject the  
22      bolus dose of midazolam. Then it injected -- then  
23      there was a two minute consciousness check, again, so  
24      we're at three minutes again. And it took one minute  
25      to inject the vecuronium bromide. And after the

1        vecuronium bromide, it took another minute to inject  
2        the potassium chloride. What is your opinion on when  
3        the inmate would die, at what point?

4                    A.            In general, the -- I'm sorry, I sort  
5        of lost track of the minutes, but -- whether you use  
6        vecuronium in general, and I'm going to qualify my  
7        answer. I know where you're going with this. But in  
8        general, as I said, 30 to 60 seconds depending on the  
9        rapidity of the injection, the heart would stop, I  
10      would think, after injection of the potassium chloride.

11                    Now, never say never, never say  
12      always. There are circumstances under which there can  
13      be problems. So let's take the scenario perhaps that  
14      could happen and so you give somebody 500 milligrams of  
15      midazolam and they start to have an obstructed airway.  
16      They start to have hypoxia. Maybe there is somebody  
17      who is very obese and they can develop hypoxia very,  
18      very quickly. And maybe they have heart disease, which  
19      a lot of people have heart disease. And that level of  
20      hypoxia and that level of heart disease and so forth is  
21      a very tenuous situation for that individual. And you  
22      know, maybe they're just barely getting by in terms of  
23      their breathing and then you give the vecuronium and  
24      they stop breathing and they have a fatal arrhythmia.  
25      And not only that, the hypoxia, what it does to the

1 heart, is that it can affect not the rhythm, but can  
2 affect the function of the heart, so the function --  
3 the heart is not beating nearly as strongly as it was.

4 So at that point, you've given the  
5 vecuronium. The heart is really beating weakly and you  
6 give the potassium chloride, well, there's not enough  
7 heart function around it to efficiently pump that  
8 potassium chloride. That potassium chloride goes  
9 through the vein into the right ventricle -- or the  
10 right atrium of the heart, the right ventricle into the  
11 pulmonary artery to the lungs. It has to come down,  
12 back into the heart and out the aorta to eventually get  
13 into the heart muscle itself to cause the -- you know,  
14 to have its effect. So in that scenario, it would be  
15 possible for someone to die from the vecuronium before  
16 the potassium chloride even hits the heart.

17 Q. I got that. But in your scenario,  
18 the potassium is being injected. So how long after the  
19 potassium is injected would that patient die, in that  
20 scenario?

21 A. I don't know I can give you a number.  
22 I can just give you a situation where there would be a  
23 delay in the administration -- there would be a delay  
24 in the action of the potassium chloride because of the  
25 failure of the -- you know, the heart is failing,

1       you're not getting enough blood flow to really --

2                   Q.           Even in that scenario, that uncommon  
3       scenario that you just mentioned, even in that scenario  
4       where the potassium bromide is injected immediately  
5       after the vecuronium bromide, how long after the  
6       potassium chloride is injected, whether the potassium  
7       chloride kills the inmate or the vecuronium bromide  
8       kills the inmate, how long after will it take them to  
9       die after the potassium chloride is injected even in  
10      that scenario?

11                  A.           Well, in that scenario, suppose that  
12      the heart is pumping so poorly that, you know, it might  
13      take two minutes, let's say, theoretically I get -- I'm  
14      just theorizing here, it might take, you know, two  
15      minutes for the potassium chloride to eventually get  
16      into the heart, the heart is pumping so slowly and so  
17      miserably. You know, I can see a scenario where that  
18      might occur, so -- and maybe the heart stops from the  
19      vecuronium -- I mean from the hypoxia before the  
20      potassium chloride actually hits the heart.

21                  Q.           And when you say two minutes, you're  
22      talking about two minutes after the potassium chloride,  
23      right?

24                  A.           That is correct, yeah.

25                  Q.           Okay. So I just want to go back to

1 where we were before. So you testified that in  
2 Tennessee, if they gave the 500 milligrams of midazolam  
3 followed by a consciousness check followed by potassium  
4 chloride, it's your opinion, just tell me if I'm right  
5 here, it's your opinion that the inmate would likely  
6 die, meaning their heart would stop beating, somewhere  
7 between 30 and 60 seconds after they received the  
8 potassium chloride, right?

9 A. That would be my guess, yes. Again,  
10 based on my experience, my animal experience, which,  
11 you know, I'm sort of extrapolating here a little bit,  
12 but that would be -- that would be my guess, but --

13 Q. And if instead Tennessee gave 500  
14 milligrams of midazolam followed by a two minute  
15 consciousness check followed by a bolus dose of  
16 vecuronium bromide followed by potassium chloride, it's  
17 your opinion that the inmate would die still 30 to 60  
18 seconds after a bolus dose of potassium chloride,  
19 right, in the general -- in a general case?

20 A. Yeah, I would say that generally  
21 speaking. You know, and that's a big waffle word,  
22 isn't it? To speak generally. So let me just clarify.  
23 I know this line of questioning has to do with, you  
24 know, does vecuronium hasten death. I get that, I know  
25 that's where you're getting at. I know this is an



1 issue that came up. And I absolutely concede, if you  
2 want to use that, I'm sure you're just rubbing your  
3 hands when someone like me says -- uses the word  
4 concede. I concede that in most cases vecuronium in  
5 this situation would not hasten death. I absolutely  
6 agree with that. In most situations, vecuronium as  
7 administered in this Tennessee protocol and in other  
8 protocols similar to it will not hasten death. What I  
9 am saying is that there are circumstances in which  
10 potassium -- where vecuronium would hasten death.

11 Q. Right. I actually think you  
12 described, and tell me if I'm wrong, you described a  
13 circumstance where vecuronium would actually make death  
14 take longer, right? You said because the heart would  
15 stop beating, the potassium chloride would be  
16 administered, and then it would take two minutes after  
17 the potassium chloride to effectuate death; is that  
18 right?

19 A. That is one scenario. But the other  
20 scenario I said was that the potassium chloride would  
21 not get to the heart before the heart stopped because  
22 of severe hypoxia. So what if the heart stopped  
23 because of the severe hypoxia before the potassium  
24 chloride gets to the heart? Well, we have -- you know,  
25 the heart is stopped, the inmate is dead, you can

1 declare death. But the potassium chloride didn't get  
2 into the heart. Under that circumstance, vecuronium  
3 hastened death. The death was the primary -- one of  
4 the primary causes of the death. Now, does that  
5 scenario happen in all executions? No. And it doesn't  
6 happen in most of them I imagine. But the question  
7 really to me was, is, you know, can it hasten death?  
8 And I think that in some situations it can.

9 Q. You're talking about very rare  
10 situations here, right?

11 A. I would not say very rare.

12 Q. No, I'm talking about -- here's my  
13 question.

14 MR. ATYIA: Objection to form.

15 Sorry, objection.

16 Q. Here's my question: Would it be very  
17 rare that potassium chloride would kill a patient  
18 within 30 to 60 seconds after being administered?

19 A. Would it be very rare for potassium  
20 chloride to get -- no, it would be very common for it  
21 to kill somebody within 30 to 60 seconds.

22 Q. I apologize. Would it be --

23 MR. ATYIA: Sorry. Sorry. I know  
24 you're having a discussion, but there is a lot  
25 of talking over. Can we just take a little

1 more time to make sure that Alex's question is  
2 finished, Dr. Antognini, and similarly that  
3 Dr. Antognini has finished --

4 THE WITNESS: Yes.

5 MR. ATYIA: No, no. I appreciate it.

6 Q. Would it be very rare that the bolus  
7 dose of vecuronium bromide would cause death within 30  
8 to 60 seconds after being administered?

9 A. I do not like the use of the term  
10 very rare. I prefer to have numbers. But I concede it  
11 would be a small minority of situations, I think. It  
12 would be -- you know, would it be five percent of the  
13 time? Maybe. I don't know an exact number. I'm  
14 providing to you a -- you know, basically a situation  
15 about that.

16 Let me, to try to help you understand  
17 how some of this material informs my discussion around  
18 this. So I'm going to tell you about a clinical case  
19 that we had at the U.C. Davis Medical Center. And  
20 these things happen unfortunately quite -- or more  
21 commonly than you would think. And what happens in  
22 these cases is basically -- I think it informs our  
23 understanding of this area.

24 So this is a patient that was going  
25 to have a kidney transplant and during the preparation,

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1 the patient is anesthetized and during the -- when  
2 they're placing a catheter into the neck vein, there  
3 are problems. The patient had a cardiac arrest. They  
4 did resuscitation, couldn't get his heart back starting  
5 and declared him dead. And then sometime later -- I'm  
6 talking, again, I don't know the exact timing, but, you  
7 know, five minutes, ten minutes later, somebody comes  
8 into the operating room to, you know, do whatever they  
9 needed to do and they notice the patient either had a  
10 heartbeat or was breathing, I don't remember. Well,  
11 they came back and resuscitated this guy. The guy left  
12 the hospital intact with no neurologic problems.

13 So, you know, this thing about how  
14 slowly it can take for drugs to take effect and all  
15 that and at the extremes, you know, at the point of  
16 death, you know, sometimes these things can take a long  
17 time, sometimes they don't. I mean, it just -- you  
18 know, what happens with these drugs when you have a  
19 really poorly functioning heart and cardiovascular  
20 system, you know, strange things can happen. Are these  
21 things rare? Yeah, they're rare, stuff like that I  
22 just described. But there are certainly other patients  
23 that have been declared and then have been  
24 resuscitated. So, likewise, when you give these drugs,  
25 they can take a long time to circulate. That's a

1 scenario I'm trying to present here.

2 Q. What do you think the point is of  
3 vecuronium bromide in this protocol?

4 A. I would defer that to the State of  
5 Tennessee in this specific case. All I can say is, you  
6 know, what the effects of the drug are. I don't know  
7 what -- why they include it. I don't know why they  
8 don't include it.

9 Q. Well, in your expert --

10 A. All I can tell you is that, you know,  
11 if you give vecuronium, this is the effect that you  
12 would expect to see.

13 Q. In your expert opinion, what is the  
14 purpose of the vecuronium bromide in this protocol?

15 A. Well, again, I think you're just  
16 asking the same question in a slightly different way,  
17 which is what is the purpose. I don't know what the  
18 purpose of the drug is as far as Tennessee is  
19 concerned. As I said, I know what the effect will be.  
20 And you know, would vecuronium by itself kill somebody,  
21 especially at this dose? And the answer is, yes, it  
22 would.

23 So maybe their intent is to -- you  
24 know, the analogy that I use and I'm not sure it's the  
25 best analogy, but when you have a firing squad,

1 sometimes you're going to have, I guess, depending on  
2 the protocol, you might have six shooters, you might  
3 have eight. When you ask yourself, well, why would one  
4 have six, why one have eight? Well, it's because, you  
5 know, if you only had three, maybe three is not enough.  
6 Maybe six is better, maybe -- you know, whatever number  
7 you choose --

8 Q. Doctor, I mean, you and I both  
9 know --

10 MR. ATYIA: Hold on, Alex.

11 THE WITNESS: I'm not finished.

12 MR. ATYIA: Please respect the  
13 witness in answering your question and allow  
14 him to finish. You can ask all your questions,  
15 but he has to be allowed to finish.

16 A. So if you think of the analogy of  
17 these drugs being like bullets, they're just using more  
18 bullets, I guess.

19 Q. Dr. Antognini, we talked awhile ago  
20 and you said the bolus dose of potassium chloride on  
21 its own was sure to cause death. So thinking back on  
22 that analogy that you just gave to me, after thinking  
23 about your prior testimony, do you believe that analogy  
24 is a bit inappropriate?

25 MR. ATYIA: Objection to form.

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1           A.           I'm not sure -- you sort of broke up  
2           there. Could you repeat that again? I think I lost  
3           part of it.

4           Q.           Sure. So you testified earlier under  
5           oath that the bolus dose of potassium chloride as used  
6           in this protocol was sure to cause death, right? You  
7           were sure that that bolus dose of potassium chloride  
8           would cause death; am I right?

9           A.           That is correct, in the vast majority  
10          of circumstances, yes.

11          Q.           Is there any circumstance as used in  
12          this protocol where a bolus dose of 240  
13          milliequivalents of potassium chloride would not cause  
14          death, in your expert opinion?

15          A.           Well, as I described to you just a  
16          moment ago, there's a scenario where the inmate might  
17          die before the potassium chloride has its effect, so --

18          Q.           If they don't die before the  
19          potassium chloride has its effect, the potassium  
20          chloride will kill them, right?

21          A.           That is correct. I think it would be  
22          highly -- it would. So even in the scenario where I  
23          talked about where there's very slow circulation, if  
24          the heart is very, very -- you know, it stops, the  
25          potassium chloride has gone into the vein, and then,

1       you know, you wait a minute, the heart doesn't -- you  
2       know, at a minute, the heart starts beating again,  
3       well, then it's going to beat and then that potassium  
4       chloride is going to get into the heart. So, you know,  
5       at some point if the heart continues to beat, it's --  
6       the potassium chloride is going to kill the inmate.

7               Q.           If you were advising a state on how  
8       to -- how to -- how to make a protocol, and a state  
9       said to you, we want -- we have two options and we want  
10      death to occur as quickly as possible. The one option  
11      is midazolam followed by potassium chloride. The other  
12      option is midazolam followed by vecuronium bromide  
13      followed by potassium chloride. Which option would you  
14      tell them to select?

15                       MR. ATYIA: Object to form.

16              A.           I do not advise states in that  
17      regard. I do not help states develop protocols.

18              Q.           Yeah, this is a hypothetical  
19      question.

20              A.           Well, even hypothetically, I'm not  
21      going to provide advice to that. I would just say if  
22      you had a protocol where you gave midazolam and then  
23      potassium chloride and you had another protocol where  
24      you gave midazolam followed by vecuronium followed by  
25      potassium chloride, in general, as I -- we use that



1 term, you're going to have a faster death with the  
2 midazolam and potassium chloride protocol because  
3 you've basically removed a step. So, by definition,  
4 you're going to have a faster death with that protocol.

5 Q. Okay. Let's switch gears a bit and  
6 talk about midazolam. When was the last time you used  
7 midazolam?

8 A. It's probably three years, four years  
9 is my guess.

10 Q. Have you ever used it as a solo drug,  
11 meaning without other drugs?

12 A. I probably -- I probably have.  
13 Earlier in my career, I might have for some procedures  
14 like cardioversion, something like that, I might have  
15 given it as a solo drug, so --

16 Q. If you gave it as a solo drug, what  
17 level of anesthetic depth were you trying to achieve?

18 A. As a solo drug, I was achieving  
19 basically deep sedation. I wasn't trying for general  
20 anesthesia. There are other instances where I gave it  
21 for induction, but I think in those cases I also used  
22 an opiate for induction. I'm not sure I ever used it  
23 by itself.

24 Q. So I just want to make sure I  
25 understand your testimony. You're saying that you gave

1 midazolam as a solo drug in clinical practice for deep  
2 sedation, not minimal sedation, not moderate sedation,  
3 but deep sedation?

4 A. I think so. I mean, again, I think  
5 of the scenario of a cardioversion when -- so just to  
6 make sure that people understand what that is. That's  
7 when you have to shock the heart basically to get  
8 somebody to come out of a particular rhythm. It's very  
9 painful if done awake and it's one of those  
10 scenarios -- or one of those clinical situations where  
11 you give the drug, but you want the person to wake up  
12 quickly. And given the different types of drugs that  
13 we had at the time, it's possible that I would have  
14 given midazolam. I cannot recall as I sit here today  
15 that, oh, yeah, I remember I did it on this particular  
16 patient, but I can imagine myself doing that back when  
17 midazolam first came out.

18 Q. If you did do it, would it have been  
19 an emergency situation?

20 A. No. No, sometimes these  
21 cardioversions are elective and sometimes they come --  
22 patients come in and they have elective cardioversions  
23 so it's not an emergency.

24 Q. And do you think that was the last  
25 time you used it as a solo drug?

1           A.           That would be it. I don't think I  
2 would have used it -- there might have been some  
3 scenarios where I did, but I don't think so.

4           Q.           And have you ever used it as a solo  
5 drug for a surgical procedure?

6           A.           I have not used it as a solo drug for  
7 a procedure that involved a skin incision, I don't  
8 think. I don't think that -- again, the only time I've  
9 ever used it as a solo drug is basically in the  
10 scenario that I think I've used it for cardioversions,  
11 but I've never used it for a procedure by itself  
12 because that's not really what midazolam is generally  
13 used for.

14          Q.           And you -- as you were speaking, you  
15 received a text message. Was that a personal message?

16          A.           I don't know. It's from my Terminix  
17 person that's saying, you know, thank you for being a  
18 customer for Terminix, one of the pest control people,  
19 so --

20          Q.           And what drugs do you use with  
21 midazolam in surgeries?

22          A.           So are you talking about -- okay,  
23 so --

24          Q.           I think you said, just so I can be a  
25 little more clear, I think you said I've never used

1 midazolam as a solo drug when making a skin incision.  
2 So what drugs were used -- well, first, did you ever  
3 use midazolam with any other drugs when making a skin  
4 incision?

5 A. So, yes. So midazolam -- sometimes  
6 what we would do is I would give midazolam up front  
7 with the induction. And then if it was a very short  
8 procedure, the skin incision might have occurred right  
9 after the -- near the induction period or right  
10 afterwards, so it would have been part of the mix  
11 essentially, so -- and that would have been given --  
12 the midazolam would have been given with an opiate like  
13 fentanyl and possibly and then maybe something like  
14 propofol or thiopental back in the early days. So it  
15 would have been in conjunction with other drugs.

16 Q. And why in a surgical procedure would  
17 you use those other drugs with midazolam?

18 A. Because the kinetics of midazolam are  
19 such that you wouldn't -- at those low, relatively low  
20 doses, and higher doses, I should say, higher doses --  
21 that's my Terminix thing again because I didn't answer  
22 a few minutes ago. But anyway, in order to achieve  
23 sort of the same levels of deep sedation, or  
24 unconsciousness, or whatever your goal is, you would  
25 have to give a lot of midazolam. And so in medicine,

1 we often give polypharmacy where we give a little bit  
2 of this and a little bit of that and you continue to  
3 reduce the side effects from the drugs, so we just do  
4 that in general.

5 Q. What is the highest dose of midazolam  
6 that you've ever given?

7 A. I would say maybe between 20 and  
8 30 milligrams, is my guess.

9 Q. And at 20 to 30 milligrams, what  
10 level of sedation are you trying to achieve on that  
11 patient?

12 A. General anesthesia basically. You  
13 know, I would say it was during -- for an induction of  
14 general anesthesia.

15 Q. So it's for induction of general  
16 anesthesia?

17 A. Correct.

18 Q. Was it for maintenance of general  
19 anesthesia?

20 A. No, the drug will -- that dose of  
21 drug will last a little bit. Basically it will last  
22 for ten minutes, 15 minutes, or something, you know,  
23 depending on the dose and all that. So if it was a  
24 very short procedure, you could rely on midazolam quite  
25 a bit, but in general, you wouldn't give it as an

1       infusion for general anesthesia.

2               Q.           Even in a very short procedure where  
3       you made a surgical incision?

4               A.           Well, in a very short procedure,  
5       excuse me, like if it was an abscess that needed to be  
6       incised, it would be possible to give midazolam and  
7       nothing else, and I think be able to incise the  
8       abscess, but --

9               Q.           But say it was heart surgery, if you  
10      could complete heart surgery in 20 to 30 minutes?

11              A.           You could not complete heart surgery  
12      in 20 to 30 minutes. But I would not do it for a  
13      procedure that, you know, basically -- midazolam is  
14      such that in order to really get to the effect that you  
15      want, you need to give a pretty large dose. So the  
16      induction dose, as I mentioned, is .2 to .3, even  
17      higher, milligrams per kilogram. And if you try to  
18      keep giving more and more, you're just going to have  
19      that drug sticking around a long time and that's not  
20      beneficial for the patient.

21              Q.           And what do you mean by sticking  
22      around a long time?

23              A.           Well, that just means that it's not  
24      being cleared out of the blood. I mean, it is being  
25      cleared out of the blood, but it's just -- it's just,

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1       you know, common sense, if you give more of a drug, for  
2       most drugs, the longer it's going to -- the drug is  
3       going to last because you've achieved much higher  
4       levels.

5               Q.           And how about a deeper level of  
6       sedation, is it your belief that midazolam will do that  
7       as well?

8               A.           It will give -- that it will last  
9       longer to achieve deeper levels of sedation?

10              Q.           Yes.

11              A.           Yeah, if you have -- so if you give  
12       midazolam at a sufficient dose to induce general  
13       anesthesia, you know, the drug concentration goes up  
14       and then it starts to come down. And if you think  
15       about, you know, what's the minimum level of the drug  
16       that you need to have around, if you have a higher peak  
17       and it starts to come down, it's just going to -- it's  
18       going to take longer to get to that minimum level and  
19       so --

20              Q.           I'm just -- so you said at .2, .3  
21       milligrams per kilogram, it gets you to a level of  
22       anesthetic depth, right?

23              A.           It induces general anesthesia at that  
24       point, yes.

25              Q.           Okay. And then you said if you give

1 more, it lengthens that period whatever anesthetic  
2 depth you are under, right?

3 A. That is correct. That's my opinion.

4 Q. Okay. Is it your opinion that it  
5 also increases the level of anesthetic depth or only  
6 that it lengthens the time that you are under that  
7 level of anesthetic depth?

8 A. Again, we're sort of talking about a  
9 dose response effect here, so I -- if you give more of  
10 the midazolam, you would achieve a deeper level of  
11 anesthesia or sedation. I realize that it doesn't  
12 cause the amount of brain suppression or brain  
13 depression, or whatever term you want to use, similar  
14 to -- or like compared to other drugs that we use, such  
15 as a barbiturate. So I do not disagree with the idea  
16 that you can achieve deeper levels of anesthesia with  
17 phenobarbital, for example, or with isoflurane. You  
18 absolutely will achieve deeper levels of anesthesia or  
19 brain suppression with those drugs as compared to  
20 midazolam.

21 Now, the caveat there, of course, is  
22 that that has not been studied at these super maximal  
23 doses in humans, first off. But I believe that the  
24 other data -- or just that you do reach a point at  
25 which giving more of the midazolam will have maybe a

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1       minimal effect on the depth of anesthesia but it  
2       certainly lasts longer. Now, having said that, I do  
3       believe that the depth that you do achieve is  
4       sufficient to do surgical or noxious procedures.

5               Q.           Go back to surgical procedures.  
6       Let's say you gave a patient 500 milligrams of  
7       midazolam because you said that would last a long time.  
8       Do you believe that would be sufficient to perform  
9       heart surgery?

10              A.           All right. So I will answer your  
11       question, but I want to do the -- give you some context  
12       there. You know, would it be sufficient to do heart  
13       surgery? Quite possibly. But it would be what I would  
14       say a woefully inadequate approach to doing anesthesia.  
15       For some reason, and maybe I'm at fault here along with  
16       other experts in this long saga of the battle of the  
17       experts related to lethal injection, but there's a  
18       comparison -- you know, you can't do surgery with this,  
19       right? A heart surgery and so on and so forth, you  
20       know, these surgeries that we're talking about, heart  
21       surgery, brain, whatever it is, you know, these take a  
22       long time to do, hours. And of course, you can't give  
23       a drug like midazolam for hours, because the patient --  
24       it would take a long time to wake them. We have much  
25       better drugs to do that.

1 Q. But let's --

2 A. I'm not done.

3 Q. Go ahead. Go ahead.

4 A. Thank you very much. But also  
5 the amount of -- the time that an inmate might be  
6 theoretically subjected to a noxious stimulus is much,  
7 much shorter than that. I mean, we have to all, I  
8 hope, maybe not, concede that the time frame is much,  
9 much shorter. So to do this comparison to heart  
10 surgery, because now you want people to think, oh, my  
11 God, you know, you can't do heart surgery with this.  
12 Well, we're not doing heart surgery. You know, they're  
13 not doing heart surgery in the execution chamber, so I  
14 think it's a bit fluff kind of question to make that  
15 kind of comparison.

16 Q. Let me ask you my question because  
17 I'm not making a comparison here, you are. So let me  
18 ask you my question again. It's a very straightforward  
19 question. It's not a comparison at all. It's a  
20 straightforward question, and all it needs is a yes or  
21 no answer. Would you feel comfortable using  
22 500 milligrams of midazolam on a patient to perform  
23 heart surgery?

24 A. No. But if I may clarify my answer,  
25 not because I wouldn't achieve the level that would be

1 sufficient, it's because there -- we have better drugs  
2 than that.

3 Q. And would you feel comfortable using  
4 500 milligrams of midazolam on a patient as the solo  
5 drug for brain surgery?

6 A. Let me go back to your earlier  
7 question and -- because you asked would I feel  
8 comfortable with heart surgery. I would not feel -- I  
9 would feel very uncomfortable using 500 milligrams of  
10 midazolam by itself for heart surgery, for brain  
11 surgery, for a long orthopedic case, whatever the case,  
12 whatever it may be. Given, you know, where we are in  
13 2022, or even in 1990, if I said, oh, I'm going to use  
14 500 milligrams of midazolam for the sole anesthetic for  
15 this long procedure, I would lose my license. All  
16 right. Not because the drug wouldn't have its intended  
17 effect. Because I have much better choices.

18 Now, in a prior deposition about a  
19 year ago, similar line of questioning, and my answer I  
20 think sort of gets to this point, if I was on a  
21 deserted island with -- you know, with you, or anyone,  
22 or my family member and they needed surgery and that's  
23 all I had, by God, I would use it.

24 Q. What if all you had was a bottle of  
25 alcohol, would you use that?

1           A.           Alcohol, as it turns out, is a  
2           general anesthetic, so, yes.

3           Q.           Okay.

4           A.           So yes, because -- you know, but the  
5           problem, of course, is that with alcohol, it's going to  
6           last a long time, similar to midazolam, it's going to  
7           last a long time.

8           Q.           You brought up a prior deposition  
9           from a year ago and you seem to have a memory of it.  
10          Did you review that deposition in anticipation for this  
11          deposition today?

12          A.           No. But it's one of the questions  
13          that sort of stuck out in my mind because it was a  
14          similar line of questioning.

15          Q.           Okay.

16          A.           So I guess I know I'm not allowed to  
17          ask questions, but if you were my -- on that desert  
18          island and I said to you, you know, you need this  
19          surgery and this is all -- either it's bite the bullet  
20          or you can have midazolam, what choice would you make?  
21          I know that's rhetorical, but anyway.

22          Q.           Do you know of a drug called  
23          atropine?

24          A.           Yes.

25          Q.           What does atropine do?

1           A.           So atropine has several effects  
2           and -- on primarily on the heart. It has other  
3           effects. It can dry the mouth out and so forth. But  
4           essentially, it has effects that it would basically  
5           increase the heart rate.

6           Q.           Do you know --

7           A.           As a primary effect.

8           Q.           Do you know if it passes through the  
9           blood brain barrier?

10          A.           It has some passage into the blood  
11          brain barrier, yes. There is -- and we talk about  
12          historically what's called mad hatter and all that  
13          where you get these effects in the brain from it, so,  
14          yes, it can pass into the brain.

15          Q.           When you're saying mad hatter and  
16          you're moving your hand by your brain, do you mean to  
17          say that it scatters perception?

18          A.           It can have that effect, yes.

19          Q.           And do you know whether atropine used  
20          to be used in heart surgery?

21          A.           Atropine has been used as -- in heart  
22          surgery. I mean, we use it for other surgeries where  
23          there are problems with the heart rate. Sometimes it's  
24          been used as a premedicant in the past. So it's not  
25          just heart surgery, but it's other surgeries as well.

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1 Q. What about -- I'm going to have a  
2 hard time pronouncing this so you're welcome to correct  
3 me, succinylcholine. And I spell it for you. It's --

4 A. Succinylcholine?

5 Q. Exactly.

6 A. Succinylcholine, yes. You might want  
7 to spell that for the court reporter.

8 Q. So it's -- and Dr. Antognini, tell me  
9 if I'm spelling it right. It's  
10 s-u-c-c-i-n-y-l-o-c-h-o-l-i-n-e.

11 A. I think you had one too many O's in  
12 it. It should be n-y-l, succinyl then choline. I  
13 don't think there's an O in there.

14 Q. Okay.

15 A. Yeah.

16 Q. And is that a paralytic?

17 A. Yes. It's different sort of action,  
18 but, yes, it paralyzes the muscle.

19 Q. And if you administer that to a  
20 patient at a normal dose, will they be paralyzed?

21 A. Yes.

22 Q. Will they be able to talk?

23 A. No.

24 Q. And what about -- I'm going to botch  
25 this as well, glycopyrrolate?

1                   A.            Yes, that's the way you pronounce it.

2                   Q.            And what type of drug is that?

3                   A.            That's a drug that's, for all intents  
4                   and purposes, similar to atropine in terms of its  
5                   effect on the heart and other -- so, for example, when  
6                   we give atropine, also with drying out the mouth,  
7                   glycopyrrolate can have that same effect.  
8                   Glycopyrrolate, however, doesn't go into the brain  
9                   nearly as much as something like atropine does.

10                  Q.            What's the point of giving  
11                  glycopyrrolate?

12                  A.            Basically sometimes people have used  
13                  it for I think pre-medication. Back in the old days,  
14                  we used to want to have a dry mouth. I don't think  
15                  people use that any -- at all anymore. It's very, very  
16                  unusual. It's primarily given -- when you give a  
17                  muscle relaxant like vecuronium or rocuronium and you  
18                  want to reverse the effects of that, it was common --  
19                  we commonly give a reversal drug, something like what's  
20                  called neostigmine, n-e-o-s-t-i-g-m-i-n, neostigmine,  
21                  and then you would also give something like atropine or  
22                  glycopyrrolate with that, and the reason why is because  
23                  the neostigmine has one effect to reverse the muscle  
24                  relaxant, but it also has a side effect of slowing the  
25                  heart rate and other effects like that. So you want to

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1 prevent that if possible, so you would give the  
2 glycopyrrolate with the neostigmine or another drug  
3 like entroferium (phonetic) that would be -- and so  
4 it's used in that way. I think that's probably the  
5 most common usage in anesthesiology.

6 Q. So I understand, glycopyrrolate, it  
7 can increase the heart rate, right?

8 A. Yes.

9 Q. And it can the MAC also?

10 A. The minimum alveolar concentration?

11 Q. Yes.

12 A. Glycopyrrolate?

13 Q. Yes.

14 A. I am not aware of glycopyrrolate  
15 having that effect. It might. I would imagine it's a  
16 pretty small effect if it's there. I don't remember  
17 that -- you know, one of my proud achievements in my  
18 area of research has been to know what affects MAC and  
19 I don't recall glycopyrrolate having a big effect on  
20 that. I could be wrong. I don't know everything.

21 Q. Okay. Does it have an effect on the  
22 EEG?

23 A. Glycopyrrolate?

24 Q. Yes.

25 A. In awake humans without any other



1 drugs, I would probably say no, because, again, it  
2 doesn't get across very easily. So even in  
3 anesthetized humans, I don't think so. I mean, if  
4 there was an effect I would have to say it would  
5 probably be pretty minimal. But, again, I'm not  
6 familiar that literature and so I could be wrong about  
7 that. There may be something out there that I don't  
8 know about.

9 Q. Okay. And when looking at an EEG  
10 when you're determining a patient's depth of sedation,  
11 what are you looking for?

12 A. In normal clinical practice, quite  
13 frankly, most -- the vast majority of anesthesiologists  
14 I don't think know how to interpret the raw, what we  
15 call the raw EEG. If they use EEG at all, it's going  
16 to be a processed EEG like the BIS monitor. You know,  
17 it's very easy to read a number between 0 and 100. But  
18 in general, with an EEG, if you're using it in  
19 anesthesia is that you would be looking at -- so when  
20 we are awake, our EEG's have a -- what's called a fast  
21 frequency low amplitude pattern, so basically it's a  
22 squiggly line that goes very fast basically up and  
23 down. But the up and down, how far up and down it goes  
24 is pretty -- is low, it's a low amplitude. And then  
25 when you into sedation and deep sedation and

1 anesthesia, general anesthesia, that EEG wave becomes  
2 higher in amplitude and slower. The waves per second  
3 basically become less, so it's a slow high amplitude  
4 wave.

5 Q. Just so I understand, because this is  
6 a bit confusing. What you're talking about is that  
7 burst suppression?

8 A. No. You can achieve burst  
9 suppression until you increase the dose, but I'm not  
10 talking about burst suppression, no.

11 Q. Okay. So what is burst suppression  
12 on an EEG?

13 A. So burst suppression occurs when an  
14 individual, and it can be due to anesthesia or drugs or  
15 it can be due to brain trauma of some sort, but  
16 basically you have these periods of where the EEG is  
17 flat or isoelectric as we call it. And then you have a  
18 burst of electrical activity, so you would see this  
19 burst of activity on the EEG. And then you go flat  
20 again. And you can measure the amounts -- you know,  
21 the time that you have a flat line basically compared  
22 to the amount of time you have a burst activity and it  
23 can give you a number to that and that gives you the  
24 amount of burst suppression.

25 Q. So does burst suppression indicate

1 something to you as an anesthesiologist when you're  
2 looking at an EEG?

3 A. It indicates to me that the -- in  
4 general, that's too deep of a level of anesthesia. You  
5 don't want too deep. You don't want to achieve, in the  
6 average individual coming into the operating room, you  
7 do not want to be at burst suppression during the  
8 anesthetic.

9 Q. What do you mean by in the average  
10 individual?

11 A. Well, there are some types of brain  
12 surgeries, for example, where basically you would want  
13 to achieve burst suppression for the purposes of what  
14 we call brain protection. But for somebody coming in  
15 for just your average, you know, gallbladder being  
16 taken out or an orthopedic procedure, you wouldn't want  
17 to be at burst suppression. You don't achieve --  
18 you've already achieved general anesthesia, the patient  
19 is unconscious, they're not going to have any memory.  
20 If you try to go to burst suppression, you're just  
21 giving too much anesthetic and potentially going to  
22 lower the blood pressure more and it's just -- that's  
23 not something that you would want to do.

24 MR. KURSMAN: I think now is a good  
25 time for a break. Can we go off the record?

1 VIDEO OPERATOR: Going off the  
2 record. The time is the 1:06.

3 (Brief recess.)

4 VIDEO OPERATOR: Back on the record.  
5 The time is 1:23.

6 Q. We just got back from a break.  
7 During the break, Dr. Antognini, did you talk with  
8 anyone?

9 A. I talked to my wife and her friend  
10 who came for their -- to go out, but not about the  
11 deposition. It was just about dog things mostly.

12 Q. And I notice you were talking to  
13 Mr. Atyia as well. Was that only about dog things as  
14 well?

15 A. Yes, I showed him my -- he asked what  
16 kind of dog it is and I showed him. And I showed him  
17 the skin disorder that she has.

18 Q. Sorry to hear that. Do you have your  
19 report in front of you?

20 A. I will bring it up. Yes, I have it  
21 in front of me now.

22 Q. Can you go to paragraph 8 of your  
23 report?

24 A. Yes.

25 Q. Okay. And do you see where you say

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1 the exact relationship between midazolam concentrations  
2 that produce unconsciousness and immobility is unknown?

3 A. Yes.

4 Q. Is it your opinion that midazolam can  
5 produce immobility?

6 A. I believe, based on the -- immobility  
7 to response to a noxious stimulus, I believe that it  
8 can. So has it been studied at the doses, for example,  
9 contemplated in the protocol? I would say no. So I do  
10 agree that the -- that's why it's unknown, because of  
11 the -- our lack of understanding or lack of data about  
12 what dose or what concentration of midazolam in the  
13 blood would be sufficient to produce immobility.

14 Q. And in this article, you cite Glass.  
15 Do you see Glass, et al.?

16 A. Yes.

17 MR. KURSMAN: And Mr. Atyia, what  
18 we're going to do is send you that Glass  
19 article right now as well. But I assume you  
20 have it because this is one of the articles you  
21 cited.

22 MR. ATYIA: Alex, if you want, I know  
23 that Dr. Antognini has all of his report  
24 documents, so if you want to not send those and  
25 just tell him to pull it up, either that or you

1           have a copy that you particularly want him to  
2           see, you can do that.

3           MR. KURSMAN: Oh, sure. We're just  
4           using the copies that you sent us, so if you  
5           want to pull it up, that would be great.

6           MR. ATYIA: Dr. Antognini, go ahead  
7           and just pull Glass up. And then if you need  
8           to look at something else, make sure you tell  
9           Mr. Kursman what you pulled up and what you're  
10          looking at.

11          THE WITNESS: Of course.

12          MR. ATYIA: And if you don't have it,  
13          ask us. I'm sure Mr. Kursman will help us.

14          THE WITNESS: I have it on my thumb  
15          drive, which is on a different computer.

16          MR. ATYIA: We'll e-mail it to you.

17          MR. KURSMAN: I'll share my screen.

18          THE WITNESS: Would it be -- it would  
19          just take me 30 seconds to get the thumb drive  
20          and if you're going to pull up other articles,  
21          that way we can save time in terms of the  
22          getting the other articles.

23          MR. KURSMAN: Okay. Let's go off the  
24          record then.

25          VIDEO OPERATOR: Going off the

1 record. The time is 1:26.

2 (Brief recess.)

3 VIDEO OPERATOR: Back on the record.

4 The time is 1:27.

5 A. Okay. So let me pull up the --

6 Q. Well, before you get there, let me  
7 ask you this: In paragraph E, it says, in the middle  
8 of the paragraph, Glass, et al., determined that the  
9 midazolam plasma concentration to produce  
10 unconsciousness in 50 percent of individuals was 270  
11 nanograms per milliliter, right?

12 A. Yes, that's what I wrote.

13 Q. Okay. What level of sedation are you  
14 talking about when you use the term unconsciousness?

15 A. I would defer to the Glass people  
16 because they used the term unconsciousness, and I  
17 believe it was to achieve on the sedation scale  
18 maybe -- a scale of 0 to 5, I believe it might have  
19 been 1 or 2, but they didn't -- but I'm not sure.

20 Q. Would that include not responding to  
21 mild stimulus?

22 A. I really would refer to the paper to  
23 make sure I'm using -- they use the term or the word  
24 unconsciousness and I'm using it here in the way that  
25 they did.

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1           Q.           The way that you use it here, though,  
2           respond to a mild stimulus, would you be conscious or  
3           unconscious?

4           A.           Probably a mild stimulus would be  
5           still conscious, in my opinion.

6           Q.           And 50 percent of the individuals  
7           with a plasma concentration of 270 nanograms per  
8           milliliter were at least conscious, according to their  
9           study, too, right?

10          A.           Correct. That's absolutely, yeah,  
11          that's the way that we would define that.

12          Q.           Now, are you aware that in the Glass  
13          study the authors use the term consciousness only to  
14          refer to whether the subject responded to a verbal  
15          command?

16          A.           I probably was aware at the time when  
17          I read it. I don't remember what the -- you know, at  
18          what point they said that, you know, when they -- when  
19          the investigators considered the subjects to be  
20          unconscious, so I would have to look at the paper.

21          Q.           And that's different than your  
22          definition of consciousness, right?

23          A.           That is correct, yes.

24          Q.           Let's go to the paper. Do you have  
25          the paper?



1           A.           Yes. Let's see here. I have it up.  
2           Actually I didn't have it up yet, so let me go to it.

3           Q.           I can share my screen as well.

4           A.           I have it here. Okay. It's coming  
5           up. It's coming up. And yes, I have it in front of  
6           me.

7           Q.           And can you see my screen as well?

8           A.           Yes, I can.

9           Q.           Okay. So let's go to Table 1 on page  
10          3.

11          A.           Yes.

12          Q.           Do you see if you don't respond to a  
13          noxious stimuli, your score is a 0?

14          A.           Correct.

15          Q.           And if you do respond to noxious  
16          stimulus but don't respond to mild prodding, then your  
17          score would be 1, right?

18          A.           Correct.

19          Q.           And if you respond only after mild  
20          prodding or shaking, your score would be 2, right?

21          A.           Yes, correct.

22          Q.           Now, if we go down to page 840, and  
23          let me know when you get there.

24          A.           Yes, I see it.

25          Q.           Do you see this table that has

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1 midazolam concentration mg per ml?

2 A. Yes.

3 Q. And do you see the sedation scores on  
4 the side?

5 A. Yes.

6 Q. You see no one in the study had a  
7 sedation score of 0, right?

8 A. That is correct.

9 Q. And that means every participant in  
10 this study who received midazolam responded to a  
11 noxious stimuli?

12 A. That is correct.

13 Q. Even the subject who had a blood  
14 level of 800 nanograms per milliliter of midazolam?

15 A. That is correct. At some point I  
16 want to bring some context into this, but you can  
17 continue.

18 Q. Go ahead.

19 A. First off, the highest level that was  
20 achieved here with midazolam, as you see there, is  
21 about 800 nanograms per ml. That's the one that's at  
22 the far right there. And then the rest of them, as you  
23 can see, were in the levels of around 550 or less.  
24 There have been other more recent studies indicating  
25 that benzodiazepines, and I cite them specifically

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1 using remimazolam, can produce sedation scores of 0.  
2 And remimazolam is going to behave like any other  
3 benzodiazepine, so the nice thing about that drug is  
4 that you can give much higher doses and not worry about  
5 how long it takes to wear off because it wears off  
6 quickly relative to midazolam.

7 Q. Okay. But right now I'm only talking  
8 about the Glass scores.

9 A. I understand. I just want you to --

10 Q. And I just want to -- we will talk  
11 about those other studies later.

12 A. Okay.

13 Q. Right now we're talking about Glass  
14 here. And I think, you know, you just said not one  
15 subject didn't respond to the noxious stimuli. And the  
16 noxious stimuli in this study was a trapezius squeeze,  
17 right?

18 A. That is correct. I'm pretty sure  
19 that's what they used.

20 Q. Okay. And if you look at the other  
21 four graphs on this page, we have isoflurane, we  
22 have -- or the other two graphs and propofol, you see  
23 these two?

24 A. Yes.

25 Q. Okay. You see there's a lot of

1 sedation scores of 0, right?

2 A. Yes.

3 Q. So subjects who received propofol and  
4 isoflurane, many of those subjects did not respond to a  
5 trapezius squeeze, right?

6 A. That is correct.

7 Q. And then if you look at figure 3 on  
8 this same page --

9 MR. KURSMAN: And I'm going to mark  
10 this as EXHIBIT 3.

11 (Thereupon, the Glass, et al., study  
12 was marked and filed as EXHIBIT 3.)

13 Q. Do you see it says open circles  
14 represent observations classified as conscious, do you  
15 see that?

16 A. Yes.

17 Q. And then it says, response to verbal  
18 commands. That's what they're defining as conscious.

19 A. Correct.

20 Q. Okay. So if you look at even around  
21 almost 600 nanograms per milliliter, you still have at  
22 least one subject responding to verbal commands, right?

23 A. Let's see. Yes, I see that. That's  
24 the open circle that you're talking about.

25 Q. Right.

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1           A.           Yeah. Yes, I see that.

2           Q.           And at 425 as well, we see another --

3           A.           Correct.

4           Q.           -- subject responding to verbal

5           command. And at 270, right, you have half of the

6           subjects responding to verbal command and then many of

7           the subjects responding to mild prodding or shaking,

8           right?

9           A.           Correct.

10          Q.           Now, if we go to table 5, which is on

11          page 843 -- let me know when you get there.

12          A.           I'm sorry, figure 5 or -- oh, sorry,

13          table 5. Yes, I see it there.

14          Q.           And do you see it says for

15          consciousness for midazolam, do you see that? It says

16          BIS 3.0 consciousness.

17          A.           Yes.

18          Q.           And then it says midazolam.

19          A.           Yes.

20          Q.           Then it says on average you need a

21          BIS score of 49 to 70, right, to be unconscious?

22          A.           The BIS 3.0, so you're talking about

23          the top -- yes, I see the number. It says midazolam

24          49, and then in parentheses 37 to 62, and then 70, in

25          parentheses 65 to 75, is that what you're referring to?

1 Q. That is.

2 A. Okay. I see that.

3 Q. And when they're talking about  
4 consciousness like we talked about before, they're only  
5 talking about whether they're responding to a verbal  
6 command, right, in this study?

7 A. That is -- again, I'm -- not having  
8 referred or looked at that part of that paper, I  
9 believe you're correct on that. Again, I would have to  
10 maybe clarify that and read it, but I believe that's  
11 correct.

12 Q. Okay. So when they use the term  
13 unconsciousness, aren't they actually talking about  
14 responsiveness?

15 A. They are talking about responsiveness  
16 because that's what they tested, that is correct. And  
17 a lot of investigators and a lot of anesthesiologists  
18 would use responsiveness as a measure of consciousness.

19 Q. So let's go to page 841 now.

20 A. Okay.

21 Q. And do you see the chart with the  
22 midazolam and the propofol, the probability of  
23 consciousness, that chart at the bottom of figure 5?

24 A. Yes.

25 Q. And do you see when you get to

1 probability of consciousness at about 50, you have a  
2 BIS score at around 65 for midazolam. Do you see that?

3 A. That is probability -- I'm sorry.  
4 This is for consciousness? Yes. Figure 5, looking at  
5 midazolam, the X there, so at a probability of  
6 consciousness is 50 percent at a BIS of around 65 or  
7 so, that is -- that's correct.

8 Q. And all -- when all they're talking  
9 about is a probability of responding to a verbal  
10 command when your BIS is 65, you have 50 percent  
11 probability of responding to a verbal command when your  
12 BIS is 65 with midazolam?

13 A. That is correct, yes.

14 Q. Now, let's go to page 844.

15 A. Okay.

16 Q. And do you see in that first full  
17 paragraph it says, in a preliminary report from this  
18 trial, we noted that increasing intensity of  
19 stimulation applied during this clinical assessment  
20 process can lead to participant arousal thereby  
21 resulting in a variable clinical state despite  
22 maintenance of constant drug levels. Do you see that?

23 A. I do.

24 Q. What does that mean to you?

25 A. What it means, which is a very

1 common -- what should be commonly understood, I hope,  
2 among anesthesiologists, but also the broader audience,  
3 is that if you have -- if you maintain a certain level  
4 of an anesthetic, that the -- stimulating that person  
5 would increase their arousal. If they are in a range  
6 where what I would call light anesthesia, and we use  
7 that term quite a bit, but -- you know, when you're at  
8 a light level of anesthesia, you can stimulate somebody  
9 and that will cause them to become aroused or to go  
10 closer to basically waking up essentially. But when  
11 you have deep levels of anesthesia, that response is  
12 going to be blunted, you know, stimulus is not going to  
13 cause as much brain arousal basically.

14 Q. But that's not what this says. That  
15 last clause is not what this says, right?

16 A. No, it does not, but I just wanted to  
17 give you the context there.

18 Q. Right. But in this paper, they had  
19 scores of 0 for propofol and isoflurane, right, meaning  
20 they didn't respond to noxious stimuli; am I right?  
21 Subjects who received propofol and isoflurane, and we  
22 talked about this before, and I can take you back to it  
23 if you want, received scores of 0. Do you recall us  
24 talking about that?

25 A. Yes, but that's -- I do.



1 Q. Okay. They were part of this study,  
2 right?

3 A. Propofol and -- yes.

4 Q. Okay. And then this sentence says,  
5 we noted that increasing intensity of stimulation  
6 during this clinical assessment process can lead to  
7 participant arousal thereby resulting in a variable  
8 clinical state despite maintenance of constant drug  
9 levels, right? And they don't -- they didn't put here  
10 we're only talking about people who received a 3, 4, or  
11 5 on the scale. We're talking about everybody here,  
12 right?

13 A. I would not agree with that  
14 assumption, and I'll tell you why. And that's simply  
15 because having written many papers in my career and  
16 reviewed many papers, if I was studying different drugs  
17 and I might have seen an effect such as described here  
18 primarily with one drug as opposed to another, I might  
19 have made a -- sort of a general statement like this.  
20 I'm not sure that you can conclude that this statement  
21 applied to all drugs studied and all the levels at  
22 which the participant started at. Now, could it, could  
23 this apply to all of them? Yes. But I'm not going to  
24 say that it absolutely -- unless they were explicit in  
25 here about that. But I think you're reading too much

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1 or somebody is reading a little bit too much in that  
2 sentence to jump to that conclusion.

3 Q. Do you agree that it would apply to  
4 all the subjects who received midazolam?

5 A. Well, I don't know. It just says a  
6 maintenance -- despite maintenance of constant drug  
7 levels. They don't specify what the drug levels  
8 were -- or what the drugs were in that sentence, so I  
9 don't know.

10 Q. Let's go back to that initial chart  
11 on page -- figure 3. Let me know when you get there.

12 A. Which figure?

13 Q. Figure 3.

14 A. Okay. Hold on, I'm almost there.

15 Q. Page 840. I have it up on the screen  
16 as well.

17 A. Yes, I have it here.

18 Q. So even at 800 nanograms per  
19 milliliter, every subject responded to noxious stimuli  
20 who received midazolam, right?

21 A. That is correct.

22 Q. Let's stop looking at this here.  
23 Now, what I want to do is I want to show you -- I'm  
24 going to show you -- let me show you an autopsy report  
25 if we can send that to Dean. And I can share my screen

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1 as well.

2 MR. ATYIA: Can I take a second to  
3 look at it once you send it?

4 MR. KURSMAN: Sure.

5 Q. Can you see this autopsy report that  
6 I have up?

7 MR. ATYIA: I'm sorry, can we hold  
8 on, Alex? I just need to take a second to just  
9 look. It's hard for me to see on the screen  
10 and I just want to take a look.

11 MR. KURSMAN: Sure. Let's go off the  
12 record while Mr. Atyia is taking a look at  
13 this.

14 VIDEO OPERATOR: Going off the  
15 record. The time is 1:46.

16 (Brief recess.)

17 VIDEO OPERATOR: Back on the record.  
18 The time is 1:47.

19 Q. Okay. So we are back on the record.  
20 And I was showing you the autopsy report of Billy Ray  
21 Irick. Have you ever seen this autopsy report before,  
22 Dr. Antognini?

23 A. I have seen autopsy reports, a number  
24 of them, and I'm not sure if this is one of them. I  
25 really don't remember.

1 Q. Okay. And do you see it says his  
2 place of death was -- where my pointer is?

3 A. Yes.

4 Q. August 9th, 2018?

5 A. Yes, I see that.

6 Q. And if you scroll down, you see it  
7 says the cause of death, lethal injection?

8 A. Yes.

9 Q. If we go down to page 2, do you see  
10 it says positive findings?

11 A. Yes.

12 Q. And it says midazolam, do you see  
13 that?

14 A. Yes.

15 Q. And then it says result 390 nanograms  
16 per milliliter, do you see that?

17 A. Yes.

18 Q. Now, in the Glass study that we just  
19 talked about, 390 nanograms per milliliter in those  
20 subjects, that would correlate with scores of about 1,  
21 2, and 3, right?

22 A. I would have to look at the -- you  
23 know, based on what I -- my recollection of that paper,  
24 that would be about right. But of course, making this  
25 leap from a postmortem concentration to that is --

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1       that's a leap that I don't think is -- is fraught with  
2       error, so -- but, you know, it is what it is. 390 is  
3       what was measured. Whether that reflected what the  
4       concentration was at the time of death or whatever is a  
5       different story.

6               Q.           And why do you say it's fraught with  
7       error?

8               A.           Well, I am not a forensic pathologist  
9       or a forensic toxicologist. But I do, as a physician,  
10      especially doing work in this area, know enough about  
11      the drawing of tissue samples including blood  
12      postmortem can be prone to error in terms of, you know,  
13      you make a measurement of the drug and at that point in  
14      time, it doesn't necessarily reflect what may have been  
15      circulating at the time that it was -- time of death,  
16      basically when the inmate was unconscious because drug  
17      concentrations change, to my knowledge, postmortem, so  
18      --

19              Q.           Are you aware that there are studies  
20      that show midazolam drug concentrations do not change  
21      postmortem?

22                           MR. ATYIA:  Objection to form.

23              A.           I am not aware of those studies.  If  
24      you have them, show them to me.  I would be very  
25      interested in seeing them.

1 Q. And are you aware of any studies that  
2 say that midazolam concentration in the blood does  
3 change postmortem?

4 MR. ATYIA: Objection, form.

5 A. I do not know if midazolam has been  
6 studied specifically postmortem, but --

7 Q. If we scroll down to page -- what  
8 would be page 5, you see it's a new autopsy report.  
9 And it says at the top Donnie Edward Johnson.

10 A. Yes.

11 Q. And do you see the date of death  
12 5/16/2019?

13 A. Correct. Yes, I see that.

14 Q. And then do you see it says cause of  
15 death, lethal injection?

16 A. I see that, yes.

17 Q. And here, if you go down to page  
18 10 --

19 A. Yes.

20 Q. -- do you see the midazolam result  
21 930 nanograms per milliliter?

22 A. Yes.

23 Q. And this is more than anyone in the  
24 Glass study, right?

25 A. That is correct. It was 930, yeah.

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1 I think it was around 800 was more in the Glass --

2 Q. Even in the Glass study, we had  
3 someone at -- we only had someone at 800 nanograms per  
4 milliliter, right?

5 A. That is correct.

6 Q. But even then, they were responding,  
7 at 800, they were responding to noxious stimuli, right?

8 A. That is correct, yes.

9 Q. And when you were talking before  
10 about how injectable drugs may circulate differently in  
11 different individual's bodies. Did you believe that's  
12 why this report, Donnie Johnson, could have had 930  
13 nanograms per milliliter while if we go to the Billy  
14 Ray Irick may have only had 390 nanograms per  
15 milliliter?

16 A. So those various factors that I  
17 discussed earlier to the variability could play a role  
18 in that. But, again, I would say I would be more  
19 concerned about postmortem changes.

20 Q. Okay. So if you gave two people the  
21 same amount of midazolam, is it your opinion that they  
22 would have a different amount of midazolam in their  
23 blood in terms of nanograms per milliliter?

24 A. Well, there's no question that they  
25 would have a different amount because -- I mean, it

1 depends on what you mean by different. You know,  
2 simply because the -- you know, it's only by chance  
3 that you would have the exact same amount measured in  
4 blood because there is variability. Even given that,  
5 you know, there is absolutely some variability among  
6 individuals in terms of the concentration that you  
7 achieve.

8 Q. Okay. Now, let's look at another  
9 study. And if we could send this study, Divoll. I'm  
10 going to share again. Have you ever seen this study  
11 before? And we're sending it to you now, but I believe  
12 you've seen it before. This is a study by Marcia  
13 Divoll, Benzodiazepine Overdosage, Plasma  
14 Concentrations and Critical Outcome.

15 A. Yes, I am familiar with that study,  
16 and I've seen it before. I don't think I used it in  
17 my -- I could have, I don't remember actually, but I  
18 know that I have -- it's come up before, so I am aware  
19 of the study in terms of the overdoses and all that,  
20 yeah.

21 Q. And this is a --

22 MR. ATYIA: Let's hold for a second,  
23 Alex. I don't -- this isn't in his materials.  
24 I need a copy.

25 MR. KURSMAN: Sure. I think we are



1 sending you a copy right now. Do you have it?

2 MR. ATYIA: Well, I'll update my  
3 e-mail. I just want to wait one second. I  
4 want Dr. Antognini to have the full document.

5 MR. KURSMAN: Let's go off the record  
6 and wait until he gets it.

7 VIDEO OPERATOR: Off the record. The  
8 time is 1:55.

9 (Brief recess.)

10 VIDEO OPERATOR: Going back on the  
11 record. The time is 1:56.

12 Q. Before we left, I was asking you  
13 about the Divoll study, so I want to take you to -- I  
14 have it up on the screen. And under results where it's  
15 highlighted, do you see where it says, in four cases,  
16 diazepam alone was injected. Although plasma  
17 concentrations of diazepam and its major metabolite,  
18 and I can spell this, but desmethyldiazepam were as  
19 high as 4,792 and 2,266 nanograms per milligram (as  
20 read) respectively, none of the four patients displayed  
21 any clinically important signs of excessive sedation.

22 A. I see that, yes.

23 Q. And how much more potent is midazolam  
24 than diazepam?

25 A. It kind of varies when you sort of

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1 look through the literature, but it's probably --  
2 midazolam is probably two to three times more potent  
3 than diazepam, approximately.

4 Q. So at -- even if we use the higher  
5 end at three times as potent, that would be equivalent  
6 to around 1,600 nanograms per milligram of midazolam  
7 and 900 nanograms per milligram of midazolam, right,  
8 for these two patients?

9 A. Approximately, yes, that's correct.  
10 Now, may I answer more fully? I don't know where -- I  
11 mean, I know where you're going with this, but I do  
12 have a point that I want to make about it, but --

13 Q. Sure. We'll get to that in a second.

14 A. Yeah, okay.

15 Q. So if you go to the next page, page  
16 2.

17 A. Yes.

18 Q. Do you see it says under discussion  
19 where I've highlighted again, high plasma  
20 concentrations of diazepam did not necessarily predict  
21 serious CNS depression?

22 A. I'm sorry, is that in the -- written  
23 in the paper?

24 Q. In the paper itself. Yeah, I have it  
25 highlighted on the screen.

1                   A.           Where are we?

2                   Q.           So it's on page 2 under discussion.

3                   A.           Oh, yes, I see. I have to apologize.  
4       For some reason, when I pulled this up, I'm not seeing  
5       your screen and my screen at the same time for some  
6       reason. Usually in Zoom, you know, I can see both of  
7       them. For some reason, it's not happening. I can't --  
8       something is not right about the way I can't -- all of  
9       a sudden there's something wrong here and I can't see  
10      your screen and my screen paper -- or that paper at the  
11      same time, so -- but I am -- I know that I see the  
12      highlighted portion here, which says high plasma  
13      concentrations of diazepam.

14                  Q.           Did not necessarily predict serious  
15      CNS depression.

16                  A.           Yes, I see that.

17                         MR. ATYIA: Objection. Is he going  
18      to be allowed to explain his answers, or do you  
19      just want him to -- and I don't mean to make an  
20      out of form objection here. I just mean to  
21      say -- I think before we keep going, we're  
22      going to lose sight of whatever he wants to say  
23      in --

24                         MR. KURSMAN: Mr. Atyia, one, the  
25      first thing is with these speaking objections,

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1           you're taking my time. But the second and more  
2           important thing, you're more than able to  
3           continue this deposition when I am done and ask  
4           him follow-up questions.

5           Q.           So back to this discussion, do you  
6           have any reason to disagree with this highlighted  
7           portion?

8                       MR. ATYIA: Dr. Antognini, you're  
9           free to explain your answers if you feel that  
10          is necessary.

11          A.           So I think I disagree with the way in  
12          which this information is being used. I don't disagree  
13          with the -- you know, there just basically it's stating  
14          what the data that they reported. But I think you have  
15          to be careful about extrapolating from midazolam doses  
16          in the Glass study to here because we're talking  
17          about -- we're not just -- the Glass study. But just  
18          what is known about midazolam, the acute  
19          administration, IV administration of midazolam and  
20          achieving a particular drug level is not -- you know,  
21          you can't equate that to a situation where you've given  
22          a different drug, in this case diazepam, that has been  
23          ingested over a longer period of time basically because  
24          it was taken orally, and people that may be tolerant to  
25          the drug because some of these -- even though, you

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1 know, some of these patients may have been already on  
2 benzodiazepines, and therefore, tolerant. So I think  
3 it's a bit of an apples to oranges comparison.

4 Q. You think comparing midazolam to  
5 diazepam is an apples to orange comparison?

6 A. I think comparing the ingestion of  
7 diazepam in these types of patients in the Divoll study  
8 and looking at their blood levels and their level of  
9 consciousness and comparing that to the acute  
10 administration of midazolam in naive subjects, that is  
11 the apples to oranges comparison.

12 Q. So my question, though, is different.  
13 It's just a yes or no question. Do you think comparing  
14 midazolam to diazepam is an apples to orange  
15 comparison?

16 A. By them -- you know, just  
17 comparing --

18 MR. ATYIA: Objection, form.

19 A. You know, maybe you're trying to get  
20 me in one of these gotcha moments so that you can  
21 disclose it to the transcript and say, hey,  
22 Dr. Antognini says that, you know, midazolam and  
23 diazepam are basically the same except for a slight,  
24 you know, difference in potency. But by itself, based  
25 on the characteristics of the drugs in the acute

1 administration, diazepam and benzodiazepine given  
2 intravenously, there is, as I said, a slight difference  
3 in potency or a difference in potency between the two.  
4 And benzodiazepines, for the most part, all work the  
5 same way, pretty much -- I should say they almost all  
6 work the same way. So in that sense, it is an apples  
7 to apples comparison. But what's the apples to orange  
8 comparison here is the way in which these drugs were  
9 given and in the patients that received them, so --  
10 anyway, I don't know whether you think that's a gotcha  
11 or not, but that's my answer.

12 Q. And do you have any reason to believe  
13 or do you -- strike that. Do you know whether the  
14 patients in the Divoll built up any tolerance to  
15 diazepam?

16 A. I do not know that.

17 Q. Okay. Now, let's go back to your  
18 report. Do you have your report still?

19 A. Yes.

20 MR. KURSMAN: Before we do, I'll mark  
21 the Divoll exhibit as EXHIBIT 4.

22 (Thereupon, the Divoll study was  
23 marked and filed as EXHIBIT 4.)

24 Q. Back to your report. And we're still  
25 on paragraph 8. And do you see you cite Inagaki?

1 A. Yes.

2 Q. Inagaki, et al., reported that  
3 midazolam at 539 nanograms per milliliter reduced  
4 halothane requirements for immobility by 70 percent.  
5 If midazolam reduced halothane in a strict linear  
6 manner beyond the 539 nanograms per milliliter, a  
7 midazolam concentration of about 770 nanograms per  
8 milliliter would produce immobility, right?

9 A. Correct.

10 Q. Now, if it didn't, if it did not  
11 reduce halothane in a strict linear manner, all of your  
12 math would be incorrect, right?

13 A. That is correct, yes. Well, yes,  
14 that is correct. As you can see, I qualify it and say  
15 it would be the -- the ratio basically would be  
16 different in terms of the amount produced -- the  
17 unconsciousness versus the amount that would produce  
18 immobility.

19 Q. Are you aware of any studies that say  
20 midazolam reduces halothane in a strict linear manner?

21 A. So I think I would have to look at  
22 the Inagaki study --

23 MR. ATYIA: Objection to form on  
24 that.

25 A. Because I may be mixing that study up

1 with others. And this, again, gets into the issue  
2 around what is linear and what is maybe an exponential  
3 set --

4 Q. Why don't we look at the Inagaki  
5 study, perhaps on your flash drive?

6 A. Probably, I do. So let's bring that  
7 up here. Yes, it's coming up now. Yes, I have it  
8 here. One second so I can --

9 Q. Can you see it on my screen? If you  
10 could go to page 615.

11 A. Okay.

12 Q. Let me know when you get there.

13 A. 615, yes, there it is.

14 MR. KURSMAN: I'm going to mark this  
15 exhibit as EXHIBIT 5.

16 (Thereupon, the Inagaki study was  
17 marked and filed as EXHIBIT 5.)

18 Q. Okay. So 615, if you go to that last  
19 full paragraph.

20 A. Yes.

21 Q. Do you see at the very end, it says,  
22 the most dramatic MAC reduction of halothane was seen  
23 as the midazolam concentration increased from 0 to 134  
24 nanograms per milliliter. Further increases in  
25 midazolam concentration continued to reduce the MAC of

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1       halothane but to a lesser degree. Do you see that?

2               A.           Yes.

3               Q.           Doesn't that mean that midazolam does  
4       not reduce halothane in a strict linear manner?

5               A.           That is the -- an interpretation of  
6       that sentence that most people would say, but -- so  
7       just sort of to answer your question here, so on page  
8       616, where they have figure 3, if you go to figure 3 --  
9       yes, figure 3, it basically would be figure 3 and  
10      figure 4. So you see figure 3 where it starts at .8,  
11      it goes from 0 and then the highest dose of around .55,  
12      you now have a MAC of basically, you know, 3 it looks  
13      like. Do you see that?

14              Q.           Yeah, I do.

15              A.           Okay. All right. So you look at  
16      that curve and you say to yourself, oh, that looks like  
17      an exponential curve.

18              Q.           Uh-huh.

19              A.           All right. But then you say to  
20      yourself, well, what if I don't look -- and this is a  
21      better way of just looking at this data.

22              Q.           Uh-huh.

23              A.           What if I look at the -- I ignore the  
24      data point at .8 and I look at the other three. And I  
25      say to myself, well, that's the line. Now, together it

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1 looks exponential, but the three data points to the  
2 right there basically excluding the far left one, that  
3 is a line. And most importantly is that they didn't  
4 study doses of .55. So to say that it is a -- not a  
5 linear relationship, yes, in total looking at that line  
6 you see, it's exponential, you don't know what might be  
7 happening beyond that line.

8 Q. So when you --

9 A. We have not studied -- I'm not done  
10 yet. We haven't studied doses beyond that. So, you  
11 know, that's why I -- from a statistical standpoint, I  
12 think we have to be careful about, you know, how we  
13 look at these data. And then if we go to figure 4, you  
14 see the actual data points there and you realize --  
15 well, they did put a curved line in there and that was  
16 a fit, but, you know, what would be the best fit if you  
17 tried a linear line there? And you know, the  
18 correlation might be a little bit lower, but it still  
19 wouldn't -- I'm not sure that the statistical -- there  
20 would be a statistically significant difference between  
21 a straight line and a curved line.

22 Q. So when you look at these graphs, are  
23 you seeing a linear line, is that what you're saying?

24 A. I'm saying that you could fit a  
25 linear and a straight line to those data, especially as

1 I look at the middle figure or the top part of figure  
2 4.

3 Q. Do you see an exponential line when  
4 you look at these graphs?

5 A. I see an exponential line as well. I  
6 should say a -- I'm not sure exponential is the term,  
7 because it's probably not -- you know, it's a curved  
8 line, so I guess, technically speaking, it would be  
9 considered exponential.

10 Q. Well, why don't we look to see what  
11 the authors of the study say?

12 A. Of course.

13 Q. Let's go to where you took me to  
14 figure 3.

15 A. Okay.

16 Q. Do you see it says the relationship  
17 showed not a linear but an exponential curve. Do you  
18 see that?

19 A. Yes.

20 Q. And are you saying you disagree with  
21 the author's interpretation of this graph?

22 A. I don't think I would disagree with  
23 that, because I -- it does, the relationship shows from  
24 all those data a nonlinear one but an exponential  
25 curve. But that doesn't mean that the data, especially

1 if you had studied at higher doses, would continue to  
2 be exponential or follow that -- an exponential, I  
3 guess, curve.

4 Q. And then if we go to the other graph  
5 you showed me on figure 4. Do you see that?

6 A. Yes.

7 Q. Do you see it says the relationship  
8 showed an exponential correlation. Do you disagree  
9 with the authors that figure 4 shows an exponential  
10 correlation?

11 A. I do not disagree with what the  
12 authors have stated there. But, again, I say that  
13 you -- you know, they didn't study larger doses and  
14 that a linear -- a straight line could fit those data  
15 as well. So I'll just leave it at that. That's  
16 basically what I've said before, is that a straight  
17 line is possible. I'm just going to just say this.  
18 I'm not trying to -- I guess I do sound like quibbling  
19 about this and it really gets down into the  
20 nitty-gritty details of statistical analysis. But you  
21 have to be very careful when you are extrapolating  
22 beyond data points that you did not collect.

23 Q. The authors collected these data  
24 points, right?

25 A. That is correct, yes.

1 Q. And the authors are saying these data  
2 points establish an exponential curve, right?

3 A. That is correct. But what they  
4 didn't say, however, is that what was the set with the  
5 linear curve and maybe the linear curve, statistically  
6 speaking, is no different from an exponential curve,  
7 the exponential curve seemed better.

8 Q. So it's your expert opinion that  
9 figure 4 and figure 3 in the Inagaki study support the  
10 finding of a linear line?

11 MR. ATYIA: Objection, form.

12 A. So let me -- I want to make sure that  
13 you understand where I'm coming from. And believe me,  
14 you know, I don't think this is -- you know, you  
15 obviously got some instruction from your experts about  
16 this, so -- unless you've had a lot of training in  
17 these statistical analyses and all that. But I'm going  
18 to focus on the top figure of figure 4, which shows the  
19 individual data points. And look how much variability  
20 there is. That is that at, for example, just at a  
21 concentration of 0 midazolam, there's a lot of  
22 variability of end-tidal halothane. And then when you  
23 go up to about like, I guess it's around like 150 or  
24 so, the first sort of large set of data points, there's  
25 a lot of variability. So there's just a lot of

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1       variability in those data. And when you have that much  
2       variability saying that a fit of an exponential curve  
3       is better than the fit of just a straight line, I don't  
4       know that the -- that would be true.

5               Q.           You're aware --

6               A.           If I may finish my answer. From a  
7       statistical --

8                       MR. ATYIA: Please allow him to,  
9       Alex. That's not a speaking objection. That's  
10      a request to you, please allow him to finish.

11              A.           So basically you would have those  
12      data points and you may not achieve -- I mean,  
13      basically you can't from a statistical standpoint say  
14      that an exponential curve is a better fit than a linear  
15      curve. So that's why I do say that it's possible that  
16      this could be a linear relationship.

17              Q.           This is a study that you cited,  
18      right?

19              A.           That is correct.

20              Q.           Okay. And the authors of this study  
21      are saying this data supports an exponential curve,  
22      right?

23              A.           That's correct, that's what they say.

24              Q.           And the authors of this study also  
25      say not a linear curve, right?

1 A. That is correct.

2 Q. And this is a study that you cited to  
3 support your position in your report, right?

4 A. That is correct.

5 Q. Okay. And I believe you just  
6 testified, well, they didn't -- they didn't get data  
7 points for the increased amount of midazolam, meaning  
8 they stopped at some point, so they don't know what  
9 will happen next, right?

10 A. That is correct.

11 Q. And this is a study that you cited,  
12 so I assume you think this study is legitimate, right?

13 A. Every study that is, you know, that  
14 we cite is legitimate. I guess that would be okay to  
15 say that. But no matter whether it's studies that I  
16 cite or it's studies that your experts cite, no study  
17 answers, you know, the question at hand directly and/or  
18 conclusively. And every study is going to have  
19 something in it, for the most part, that basically is  
20 going to perhaps be -- doesn't support your position.  
21 So, you know, if we had a study or group of studies  
22 that answered all these questions, we wouldn't be here.

23 Q. I'm just asking you this: Do you  
24 trust the opinions of the authors of this study in this  
25 report?

1           A.           I trust their opinion. I'm not sure  
2 I would use the word trust, but I would -- I do not, I  
3 do not disagree with their interpretation. I have  
4 other interpretations that are possible, but I don't  
5 disagree with their interpretation of the data.

6           Q.           Do you defer to their opinions in  
7 this report?

8           A.           I wouldn't say I would defer to their  
9 opinions. I would just -- you know, when we, as  
10 physicians especially, someone like myself that's been  
11 involved in a lot of research and all that, I don't  
12 necessarily use the word defer. I look at a paper and  
13 I say, well, you know, I say -- and I've said this  
14 about my own papers, every paper, every study has  
15 limitations, and I'm just pointing out some of the  
16 limitations of this particular paper.

17          Q.           Do you think this paper is accurate?

18          A.           I don't -- I have nothing -- I agree  
19 that in a sense that I have nothing to say that the  
20 data that they reported is inaccurate. The  
21 interpretation, however, is a slightly different  
22 subject, I think.

23          Q.           Okay. Well, let's stay on this page,  
24 page 4, the first full paragraph on the left side.

25          A.           What's the page number?

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1 Q. I apologize. It's page 616. And I  
2 am right here. Do you see the little hand I'm putting  
3 over it? Do you see it says midazolam acts at the  
4 specific receptors in the central nervous system, and  
5 the number of benzodiazepine receptors is limited.  
6 Therefore, benzodiazepine receptors will become  
7 saturated at a sufficient level of serum midazolam  
8 concentration. The present results indicate clearly  
9 that the midazolam action to potentiate the anesthetic  
10 action of halothane has a saturable nature. Do you see  
11 that?

12 A. I do.

13 Q. Doesn't that mean that the authors of  
14 this study believe that midazolam has a ceiling effect?

15 A. I do not know if they use that term  
16 ceiling effect, but I would say that they -- you could  
17 interpret that from that paragraph. That's what they  
18 are inferring.

19 Q. And if you go to the next sentence,  
20 it says, the present results indicate clearly that the  
21 midazolam action to potentiate the anesthetic action of  
22 halothane has a saturable nature, right? Do you see  
23 that?

24 A. I see that, yes.

25 Q. So are the authors saying that the

1 GABA receptors can become saturated by the midazolam?

2 A. That is -- yes, I guess saturated is  
3 a bit of a -- I'm not sure that's a pharmacologically  
4 accurate way of saying it, but it's -- I agree that  
5 that word would be acceptable.

6 Q. And they're saying at some point no  
7 matter how much more midazolam you give to a patient,  
8 the effects won't increase because the receptors will  
9 be saturated, right?

10 A. That is -- yes, that is the  
11 interpretation of that. And we've already discussed  
12 about issues around when ceiling effect occurs and all  
13 that, but -- so, I can say, yes, that's -- that is  
14 the -- one interpretation of that, yes.

15 Q. And do you disagree with that?

16 A. I don't disagree with the statement  
17 that the data does show that midazolam action to  
18 potentiate the anesthetic action of halothane has a  
19 saturable nature. But again, that's one interpretation  
20 of their data.

21 Q. And you're not disagreeing with that  
22 interpretation, right?

23 A. I am -- again, I'm not disagreeing  
24 with it. I'm just saying that their -- the data are  
25 limited. They didn't study higher doses, and

1       therefore, you don't know what might be occurring at  
2       higher doses.

3               Q.           Well, let's go to page 5.

4               A.           Okay. Is that the next page, I  
5       guess?

6               Q.           That's the next page. That's page  
7       617. And do you see it says at the bottom, in  
8       conclusion, midazolam produced marked reduction of  
9       halothane MAC in humans at the serum concentration  
10      lower than that required to cause sleep. It appears  
11      difficult to determine the type of interaction between  
12      halothane and midazolam in the anesthetic efficacy  
13      because their relationship shows an exponential fit,  
14      indicating the saturated nature of midazolam action to  
15      potentiate the anesthetic action of halothane. Do you  
16      see that?

17              A.           Uh-huh. Yes.

18              Q.           So, again, here they're talking about  
19      the same ceiling effect again, right?

20              A.           Yes. They don't use that term, but  
21      that's what they're implying, I think.

22              Q.           Okay. So we can close this. Let's  
23      go back to your report on paragraph 8. Can you give me  
24      a number that you believe a midazolam concentration  
25      would cause -- would produce immobility?

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1           A.           I cannot. And I'll tell you why,  
2       because the -- I have cited studies, animal studies  
3       where -- and this is the mouse study where midazolam  
4       produced immobility. They did not study drug  
5       concentrations in those animals, and even if they did,  
6       those are in animals. And I've already said more than  
7       once that we don't know what happens -- we don't have  
8       data, I should say, with midazolam beyond what has been  
9       purported in some of these studies that you've pulled  
10      up. We don't know the drug concentrations at, you  
11      know, these massive doses, so --

12                    I could cobble together, I suppose, I  
13      haven't, I could cobble together what might be  
14      an amount, but I would be -- you know, I would be  
15      hesitant to do that. I know Dr. Stevens has done a  
16      similar analysis for midazolam in terms of the ceiling  
17      effect and so forth and I think that analysis he has  
18      abandoned, at least I think based on his testimony,  
19      because it's very difficult to extrapolate from animals  
20      and humans, to humans, and there are a lot of moving  
21      parts. It's just -- I wouldn't have confidence in a  
22      number basically -- based on that type of analysis.

23           Q.           So if you don't have confidence in a  
24      number, can you give a number of the amount of  
25      midazolam it would take to produce unconsciousness as

1       you define it in the report?

2               A.           Well, those data I think are a little  
3       bit more amenable to that type of analysis. So first  
4       we can look at -- we could look at the Glass study and  
5       look at those concentrations of midazolam. We have the  
6       remimazolam papers that I cited where immobility was  
7       produced at least immobility to, I believe it was  
8       trapezius squeeze. So we know that with  
9       benzodiazepines, based on those studies, can produce  
10      immobility to -- at least to a trapezius squeeze. So  
11      it's possible to take some of the pharmacokinetic data  
12      that we have and put that together, but -- so a little  
13      bit easier to do, but it still would be quite a bit of  
14      extrapolation.

15             Q.           Let's go to paragraph 10.

16             A.           And that's of my --

17             Q.           Of your report. You see you give a  
18      definition of pain?

19             A.           Hold on just one moment, please.

20             Q.           Sure.

21             A.           Paragraph 10?

22             Q.           Yes.

23             A.           Yes, I see it, yes.

24             Q.           Do you agree that an inability to  
25      communicate does not negate the possibility that a

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1 human experiences pain?

2 A. I'm not sure -- I agree with the  
3 statement that if you are unable to communicate doesn't  
4 necessarily mean that you are not having pain. Even if  
5 you cannot communicate, you can still have pain.

6 Q. Do you think that should be in your  
7 definition as well in paragraph 10?

8 MR. ATYIA: Objection, form.

9 A. Let's see. So if what you could do  
10 is maybe give me an explicit statement that you would  
11 think I should include in that.

12 Q. Sure. The inability to communicate  
13 does not negate the possibility that a human  
14 experiences pain.

15 A. That is -- actually, I believe that  
16 might even be on the ISP web site, so I agree with that  
17 statement.

18 Q. So why didn't you include it in  
19 paragraph 10?

20 A. Because I don't think that the --  
21 it's pertinent, in my opinion, it's pertinent to these  
22 discussions. Now, obviously, you do, as well as the  
23 experts, because you're coming from the perspective of  
24 that, you know, these individuals are awake, the  
25 midazolam doesn't produce unconsciousness, and that

1 when you get the vecuronium, they're unable to  
2 communicate it, and therefore, they're in pain. And I  
3 just -- I obviously disagree with that. I think they  
4 are unconscious and that they don't perceive pain  
5 because of the fact that they're unconscious. So  
6 that's the reason why I don't think it's particularly  
7 important to state that in my definition of pain.

8 Q. If you know it's a relevant point of  
9 this case, why did you decide to leave it out of your  
10 definition if the IASP defines it as such?

11 MR. ATYIA: Objection, form.

12 A. I just -- again, I don't think  
13 it's -- I'm not disagreeing with the statement. I'm  
14 just saying that I don't think it applies, based on my  
15 opinion of what midazolam does. So you can say  
16 anything, basically, about general anesthesia, right?  
17 I mean, you can say that, you know, the person is  
18 unable to communicate, and therefore, we don't know  
19 whether they're having pain or not, so --

20 Q. Or an individual who is doing a  
21 consciousness check in a hospital setting, would you  
22 want them to know that the inability to communicate  
23 pain does not mean that the person is not feeling pain?

24 A. Yes. You know, in certain  
25 circumstances, you know, obviously, especially if

1       you're using a neuromuscular blocking drug, then, you  
2       know, that person is unable to communicate that.

3               Q.           And in the lethal injection context,  
4       we're using a neuromuscular blocking drug, right?

5               A.           That is correct, yes.

6               Q.           So if you would want a person in a  
7       hospital setting knowing that definition, why wouldn't  
8       you want the Court to know that definition?

9               A.           I'm not saying that the Court can't  
10      know that definition. I just did not include it in  
11      that paragraph, so -- I'm not hiding that. I didn't  
12      say otherwise. I didn't, you know, say that --  
13      contrary to that statement, so --

14              Q.           Well, while we were talking before,  
15      you mentioned that that was part of the IASP pain  
16      definition, right?

17              A.           Well, it's not part of the pain --  
18      you know, the pain definition, as I've written there, I  
19      think it's based on when I was at the web site. And  
20      that statement that you've made there is a disclaimer.  
21      Maybe disclaimer is not quite the right word. But it's  
22      a caution that just because somebody is not responsive  
23      because of a variety of different clinical scenarios  
24      doesn't mean that they're not having pain.

25              Q.           Are you aware that the footnote on



1 the bottom of your report is in a bold definition from  
2 the IASP and the IASP has a revised definition of pain?

3 A. I was not aware of that because I --  
4 is this something that happened since I accessed it on  
5 12/8/21?

6 Q. That I don't know. But you were  
7 aware of the other portion that I mentioned, so I am  
8 just wondering why it wasn't included in here, but we  
9 can move on. Let's go to paragraph 13 of your report.

10 A. Okay. I'm there. Are you --

11 Q. Do you see the very bottom? It says,  
12 doses above 5 milligrams must be used with extreme  
13 caution because of the well-known risks of  
14 unconsciousness, respiratory depression, apnea, and  
15 death. And then you have, see package insert.

16 A. Yes, I see that.

17 Q. When you use the term unconsciousness  
18 here, what are you referring to?

19 A. I am referring to the same way I  
20 think I previously defined it as being unresponsive to  
21 various stimuli and a decreased awareness of your  
22 environment. So that is the -- and I'm using that sort  
23 of from -- sort of the average physician's perspective  
24 of unconsciousness.

25 Q. Are you aware that the black box does

1 not use the term unconsciousness?

2 A. Well, I don't believe that the black  
3 box does, but I believe that the package insert, I  
4 would have to review it again, but I believe that the  
5 package insert certainly talks about the effects of  
6 midazolam on consciousness, so -- maybe not all the  
7 things that I've written there are part of the black  
8 box warning, but in total, the package insert does  
9 support the idea that midazolam is a very dangerous  
10 drug.

11 Q. Why don't we pull up the package  
12 insert?

13 A. Okay. I'm pulling it up on my end.

14 Q. Do you see it says on my -- midazolam  
15 hydrochloride, Hospira, Inc.?

16 A. If you can -- so there's some --  
17 again, I apologize. Somehow when I start to bring  
18 things up, it makes the Zoom meeting window really  
19 small and I can't seem to increase it. Maybe if I  
20 can -- no, that's not it. I'm sorry, it just  
21 doesn't -- I can't -- oh, wait. I think I've figured  
22 it out. My apologies. So I see that now. I see your  
23 screen much larger now.

24 Q. Okay. So do you see it says  
25 midazolam has been associated with respiratory

1 depression, arrest, especially when used for sedation  
2 in non-critical care settings?

3 A. Yes.

4 Q. It doesn't say anything about  
5 unconsciousness, does it?

6 A. No, I'm not there, I guess. Does it  
7 say it anywhere else? Why don't you tell us? Is it  
8 anywhere else in the package insert?

9 Q. So now do you see -- are you aware  
10 that one-third of all drugs have a black box warning?

11 A. I have heard that amount, yes, that  
12 is correct. I mean, I shouldn't say it's correct. I'm  
13 not -- I don't have any direct knowledge, but I know  
14 that it's probably a large number of drugs that have a  
15 black box warning.

16 Q. And do you know what the dose of  
17 midazolam is that would cause a fatal reaction in a  
18 patient?

19 A. Well, again, even a low dose of  
20 midazolam can kill a patient, so -- I've heard this  
21 before. You know, you say, you know, midazolam is a  
22 safe drug, it doesn't kill people. Then I would  
23 challenge your expert witnesses, particularly Dr. Van  
24 Norman, to give midazolam willy-nilly to patients who  
25 walk away and, oh, just don't worry about it. It's not

1 a lethal drug. I mean, that's ridiculous. It's  
2 absolutely ridiculous to say that midazolam is not a  
3 dangerous drug. By itself, midazolam has killed  
4 patients.

5 Q. What is the mechanism of the action  
6 at which it kills patients?

7 A. By itself, it would be the production  
8 of unconsciousness and whatever amount of  
9 unconsciousness you want to define, but it's enough  
10 that the patients have airway obstruction and they  
11 basically stop breathing because of an airway  
12 obstruction and they become hypoxic and they die.

13 Q. So it's respiratory depression,  
14 airway obstruction, hypoxia?

15 A. Yes.

16 Q. And those aren't the intended actions  
17 of midazolam, right?

18 A. They are not. Side effects, but not  
19 intended.

20 Q. And what is the -- can a barbiturate,  
21 an overdose of a barbiturate kill somebody?

22 A. Yes.

23 Q. And what would be the mechanism of  
24 action that would kill a person in the course of -- in  
25 the case of a barbiturate?

1           A.           Depending on the amount and the speed  
2           with which it was administered, you would get an airway  
3           obstruction. You would also potentially get apnea  
4           where you basically stop the respiratory drive. With  
5           midazolam, you may not stop the respiratory drive, per  
6           se, but you get an obstructed airway. Whereas with a  
7           barbiturate of a high enough dose, you would not only  
8           get potentially an airway obstruction, you would  
9           actually stop the attempts at breathing as well. And  
10          then at even higher doses, you can get profound  
11          cardiovascular depression where the heart and blood  
12          pressure, you know, function goes down very low and  
13          then death ensues.

14          Q.           And they would still be producing  
15          lower levels of sedation to kill an individual, right?

16                   MR. ATYIA: Objection to form.

17          A.           Lower levels of sedation?

18          Q.           Meaning a barbiturate could kill an  
19          individual just by its mechanism action, by its  
20          intended effect, if you give enough of it?

21          A.           Yeah, I'm not sure that I would say  
22          by its intended effect. I mean, obviously you don't  
23          intend to, you know, give these drugs to produce blood  
24          pressure decreases and all that. If you use a  
25          barbiturate in, in a typical way in which you would use

1 a barbiturate, at least nowadays, which of course even  
2 now it's very rare, but you use a barbiturate to  
3 induce, let's say, a coma which is going to be profound  
4 brain depression, you get, unfortunately, as a side  
5 effect the effects on breathing and the blood pressure.  
6 So you have to support the breathing, but sometimes the  
7 blood pressure, even with support, the blood pressure  
8 gets very low. So, yeah, I'm not sure that that  
9 question was worded in a way that I feel comfortable  
10 answering, so --

11 Q. Well, let me ask you this, because  
12 you talked about side effects. With midazolam,  
13 midazolam can kill a patient based on its side effects,  
14 right? Is that right?

15 A. That is correct, yes.

16 Q. Now, a barbiturate, on the other  
17 hand, could kill a person not based on its side effects  
18 but based on its method of action, what it's used to  
19 do, right?

20 A. I'm having a -- you're getting me  
21 there. I understand where you're going with that. I  
22 think what I'm a little bit -- about here is that, you  
23 know, midazolam kills because of the side effects,  
24 basically, and you're saying that kind of -- you know,  
25 a barbiturates kills because of the intended effect.

1 And I don't think that's the right -- it's necessarily  
2 the right way to look at it.

3 And basically, my point is that with  
4 midazolam, you give higher and higher doses of it and  
5 you'll begin to see more of these effects. Your  
6 therapeutic goal here is to cause brain depression with  
7 midazolam. And I use that term broadly speaking, brain  
8 depression in a sense that you're going to produce  
9 amnesia, you're going to produce unconsciousness, and  
10 so forth. So that is the intended effect of using  
11 midazolam at higher and higher doses, so, for example,  
12 with the induction of general anesthesia with  
13 midazolam. And all drugs like that, midazolam,  
14 whatever, phenobarbital, fentanyl, they also cause  
15 airway obstruction that can also affect the breathing.

16 So, you know, the side effects and  
17 the intended effects sort of go hand in hand with these  
18 drugs. So I'm not sure that you can make that kind of  
19 separation, is my point. Except to say -- and again,  
20 I'm not trying to agree -- I mean, I more or less agree  
21 with what you're trying to get to, the phenobarbital in  
22 terms like it's so powerful, you get to these  
23 unintended or the side effects much more quickly and  
24 much more easily than you would with midazolam.

25 Q. And is that a result of brain

1 depression for a barbiturate?

2 A. Barbiturates also can cause a direct  
3 vasodilation, as I recall, a direct peripheral  
4 vasodilation and a depression of the heart that you  
5 wouldn't see really I think as much with midazolam, I  
6 believe. So it's not just the brain depression, but  
7 also some of these peripheral effects as well.

8 Q. Does midazolam have a fatal dose?

9 A. So there are data out there on  
10 various drugs about, you know, the toxic dose, the  
11 lethal dose, and so forth. Trying to figure out what  
12 that dose is, is obviously a little bit difficult with  
13 a drug like midazolam because you can't -- I mean, you  
14 don't want to obviously study that. You would have to  
15 kill patients, so obviously you're not going to do that  
16 type of study, and you have to put those together. All  
17 I can say is that there are doses in humans that have  
18 died from the dose, some of them a relatively small  
19 dose.

20 Q. I'm talking about a toxic dose. I'm  
21 talking about a fatal dose. Does midazolam have a  
22 fatal dose?

23 A. Well, let me answer that question in  
24 the following way, which is that there are -- if you  
25 take a patient and you give them 5 milligrams or 3



1 milligrams of midazolam and nothing else and you come  
2 back and they're dead, then that was a fatal dose for  
3 that patient. For someone else, maybe it would take  
4 20 milligrams or 30 milligrams. You know, we don't  
5 have those types of data, so I cannot tell you with  
6 midazolam if there was a -- you know, what that fatal  
7 dose is.

8 MR. KURSMAN: Let me mark the black  
9 box as EXHIBIT 6.

10 (Thereupon, the midazolam black box  
11 warning was marked and filed as EXHIBIT 6.)

12 Q. I assume you're aware that drugs --

13 MR. ATYIA: Alex, we only saw it on  
14 the screen. I need to get a copy of that.

15 MR. KURSMAN: Okay. Hayden, could  
16 you send a copy of that, the black box?

17 MR. ATYIA: Can we go off the record  
18 on that for one second?

19 MR. KURSMAN: Sure.

20 VIDEO OPERATOR: Going off the  
21 record. The time is 2:45.

22 (Brief recess.)

23 VIDEO OPERATOR: Back on the record.  
24 The time is 3:00.

25 Q. We just went on break for about 15

1 minutes. During the break, did you talk to anybody,  
2 Dr. Antognini?

3 A. I called my vet's office because I  
4 got a message that they have contacted me about our  
5 dog, but I'm not sure who it was. But anyway, that's  
6 the only person I've spoken to.

7 Q. Okay. And did you have a chance to  
8 review the black box label that was sent?

9 A. Actually, I did not do that. I'm  
10 sorry, I didn't know -- I apologize. I was told I  
11 wasn't supposed to look at any material during breaks,  
12 so I did not do that.

13 Q. Okay. Well, let's go to -- we were  
14 talking a minute ago about the fatal dose of midazolam,  
15 and I asked you if you knew whether there was a fatal  
16 dose of midazolam. Do you know whether there is a --  
17 well, let me ask this first: Do you know the  
18 difference between a toxic dose and a fatal dose?

19 A. A toxic dose, I mean, I get the  
20 definitions correctly, but when we think about a toxic  
21 dose or a toxic effect when we're looking at a  
22 particular adverse outcome of some sort, that it  
23 causes, let's say liver damage or something like that,  
24 causes toxicity, whereas as a fatal dose actually kills  
25 somebody, a lethal dose. So usually the toxic dose

1       would be less than the fatal dose usually.

2               Q.           And are you aware that midazolam does  
3       not have a fatal dose?

4               A.           You would have to show me where that  
5       comes from, because, as I say, if you give, you know,  
6       midazolam by itself, you know, it will kill -- you  
7       know, some people die, so I don't know how you can say  
8       that it does not have a fatal dose.

9                       MR. KURSMAN:   Okay.   Let me show you  
10       what I will mark as, I believe, EXHIBIT 7  
11       maybe.   And this will be a study by Schultz.

12                      (Thereupon, the Schultz study was  
13       marked and filed as EXHIBIT 7.)

14                      MR. KURSMAN:   I believe we sent it to  
15       you, Dean.

16                      MR. ATYIA:    I'm sending it to  
17       Dr. Antognini.   I'll let you know when he gets  
18       it and we have time to be ready for it, I  
19       guess.

20               Q.           And offer just, Dr. Antognini, look  
21       at my screen and see, have you -- let me take you to  
22       the top.   Have you seen this article before?   Martin  
23       Schultz, Therapeutic and Toxic Blood Concentrations --

24               A.           Yes, I believe I have, yeah.   And I  
25       believe Dr. Stevens has produced this before, I

1 believe, but I'm not sure. But anyway, I think I'm  
2 pretty sure I've seen this before.

3 Q. Okay. So if I take you to page 65,  
4 you see it has substance, midazolam?

5 A. Yes.

6 Q. And do you see it has a therapeutic  
7 dose?

8 A. That's milligrams per liter, yes.

9 Q. And do you see there's a toxic dose?

10 A. Yes.

11 Q. But do you see it does not have a  
12 fatal dose?

13 A. I see that. Okay. So let's talk a  
14 little bit about that. So you asked me earlier, you  
15 know, is there a fatal dose? Do we know a fatal dose?  
16 And again, I think that comes from some of your expert  
17 witnesses. So imagine your grandmother is in the  
18 hospital, going to have a procedure, and I say to you,  
19 I'm going to give your grandmother 10 milligrams of  
20 midazolam, or 20 milligrams of midazolam, or 5, or  
21 whatever, I'm going to walk away and I'm not going to  
22 monitor the patient. And you're going to say, well,  
23 wait a minute. That's -- should you be -- shouldn't  
24 you be monitoring? Oh, no, I don't have to monitor.  
25 There's no fatal dose. The fatal dose has not been

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1 determined, so don't worry about it. I mean, that is  
2 an absolutely ridiculous approach to try to claim that  
3 there's no fatal dose of midazolam by showing me a  
4 paper that has a blank box in it. I mean, that's  
5 getting down to -- I won't make any comments about the  
6 utility of this type of paper, but I think you get my  
7 point.

8 Q. No, I don't actually. Do you know  
9 the fatal dose of midazolam?

10 A. The fatal dose, you do not maybe -- I  
11 don't know what your understanding is or anyone else's  
12 understanding is about establishing a fatal dose like  
13 this. In order to know the fatal dose, you have to  
14 kill people. People have to die as a result of it.  
15 And you know, we don't know what that dose is because,  
16 thankfully, we haven't had enough people die from it to  
17 be able to establish that with confidence. But if  
18 midazolam did not kill people by itself, we wouldn't  
19 have all this black box warning and these precautions  
20 in hospitals and so forth.

21 Q. As you can see from this table, other  
22 drugs have fatal doses, right?

23 A. Yes.

24 Q. And are you aware that other  
25 anesthetics have fatal doses?

1                   A.            Yes.    Now, let's take a look -- I  
2    didn't realize this, but the drug fourth down,  
3    metocurine, do you see that drug there?

4                   Q.            I do.

5                   A.            Do you know what metocurine is?

6                   Q.            I do not.

7                   A.            Metocurine is a drug like vecuronium.  
8    It's a muscle relaxant.   If you give metocurine to  
9    somebody, they will become paralyzed and they will die,  
10   just like with vecuronium.   But wait a minute.   There's  
11   no -- there's a blank box in toxic and there's a blank  
12   box in comatose-fatal.   All right.   So let's go -- once  
13   you scroll down and let's see what it says about  
14   vecuronium.   Can you go down to vecuronium, please, if  
15   they have it?   Scroll up.   All right.   Let's try -- oh,  
16   there it, vecuronium.   Look, vecuronium, the block that  
17   -- that box is empty.   So using your own analysis of  
18   this paper, vecuronium, it can't cause death.

19                  Q.            That's not my analysis of the paper.

20                  A.            Wait a minute, sir.

21                  Q.            I'm asking --

22                  A.            What you're saying is that there's no  
23   established dose of -- fatal dose of midazolam because  
24   there's nothing in that box, and you can make the same  
25   assumption based on the absence of vecuronium, but we

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1 all have agreed the vecuronium can kill somebody, so --

2 Q. What's the fatal dose for vecuronium?

3 A. Probably in the range of maybe --  
4 well, basically it's going to be less than the  
5 therapeutic dose probably. I'm not sure what the --  
6 they say milligrams per liter in terms of blood  
7 concentration. The fatal dose would probably be quite  
8 similar to that because the intended effect of a  
9 therapeutic dose of vecuronium is to produce muscle  
10 relaxation and muscle relaxation, of course, is going  
11 to stop the breathing, so --

12 Q. Let's go to page 72. And I'm going  
13 to take you to page 72. Do you see pentobarbital?

14 A. Yes.

15 Q. Do you see it has a fatal dose?

16 A. Yes.

17 Q. Why do you think pentobarbital has a  
18 fatal dose but midazolam does not?

19 A. All right. You're obviously going  
20 along a script here because you want to get to your  
21 questions without realizing what I just pointed out.  
22 This table and this paper obviously is going to be  
23 incomplete because some of those data are not either  
24 known or shouldn't be known because you don't want to  
25 kill people. So let's go back to the vecuronium

1 example. There is no dose noted there, fatal dose of  
2 vecuronium, but we've all agreed that it can kill  
3 patients. So how would you propose that we establish  
4 the fatal dose of vecuronium?

5 Q. I'm sorry. I'm just asking you why  
6 do you believe pentobarbital has a fatal dose but  
7 midazolam does not?

8 A. Because the sufficient data on the  
9 doses of pentobarbital that caused those blood levels,  
10 and therefore, has been associated or has caused death,  
11 because those data have been obtained not because of  
12 some, you know, study. That would be obviously  
13 unethical. But because of patients that had been  
14 overdosed on pentobarbital either many years ago when  
15 pentobarbital was commonly available -- but, you know,  
16 it's based on studies like that.

17 Q. And they don't have that data for  
18 midazolam, right?

19 A. Yeah. You are barking up this  
20 tree -- I mean, I have to admire that. You are right.  
21 Let's go back to the midazolam if we could.

22 Q. Sure.

23 A. Okay. In the box for midazolam, it  
24 says comatose or fatal, that box is empty. There is  
25 not a dose there. I agree with that.



1 Q. Right. So --

2 A. But what's your point about all this?  
3 I've already shown you that there's no such data for  
4 vecuronium or for some of the other drugs, so --  
5 anyway, go ahead.

6 Q. So for vecuronium, for instance,  
7 right, a hospital wouldn't have data on patients  
8 overdosing on vecuronium, right? That's just not  
9 something you would overdose on, right?

10 A. Hopefully not, no.

11 Q. Right. But the hospital does have  
12 data on people overdosing on barbiturates, right?

13 A. There's published literature that  
14 supports that level of -- blood level for a fatal dose  
15 of pentobarbital, that is correct.

16 Q. And that's how the fatal dose was  
17 determined, right?

18 A. That is -- I think. I'm not sure how  
19 they determined it in that particular -- for this  
20 paper, but that would be about right, I think. That's  
21 how they would do that.

22 Q. But there is no data relating to  
23 midazolam overdoses being fatal, right? They don't  
24 have that data and that's why it's left blank?

25 A. They do not have that data.

1 Q. Okay. Even though midazolam has been  
2 in existence for decades?

3 A. Even though it's been in existence  
4 for decades.

5 Q. And I showed you a study earlier  
6 where patients have come into the hospital with very  
7 high levels of benzodiazepines in their system, right?

8 A. Yes.

9 Q. Now, let's go back to your report.

10 A. Okay.

11 Q. And do you see that in -- you cite in  
12 this same paragraph that we were just talking about,  
13 you cite this Vuyk, et al., 2019?

14 A. Yes.

15 Q. Do you see that? Okay. Do you have  
16 Vuyk in front of you? Do you have that in your --

17 A. Actually, I'm not sure if I have the  
18 full chapter here. If you want to bring it up --

19 MR. ATYIA: Alex, could you send it?

20 MR. KURSMAN: I'll bring it up as  
21 well.

22 Q. So this is the Vuyk article that  
23 you --

24 A. Yes.

25 Q. So we go down to page 654 -- tell me

1 if you can see the screen or if you want it --

2 A. No, that's pretty good right there.

3 Q. 654. And you see this is the section  
4 on benzodiazepines?

5 A. Yes, I see that.

6 Q. If I scroll down. Do you agree that  
7 in clinical practice midazolam is often used  
8 immediately before induction of anesthesia?

9 A. That is it's most common use, that is  
10 correct, in a clinical setting.

11 Q. And if we go to page 656, do you see  
12 it says all benzodiazepines have hypnotic, sedative,  
13 anxiolytic, amnesic, anticonvulsant, and centrally  
14 produced muscle relaxant properties?

15 A. Yes.

16 Q. Why do you think it doesn't say  
17 anesthetic properties?

18 A. I would say that's because of the  
19 fact that, especially in 2020 when this book was  
20 published, which was just a couple years ago, that we  
21 would not use midazolam for an induction of general  
22 anesthesia because we have such better drugs now. So  
23 it would be very -- you know, I certainly don't fault  
24 somebody for leaving that off the list there,  
25 especially since it says all benzodiazepines and we

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1 wouldn't use all benzodiazepines for the induction of  
2 anesthesia. If we were to use one, it would be  
3 basically midazolam, if we did it. So the absence of  
4 that doesn't mean that it doesn't -- you know, that it  
5 doesn't exist.

6 Q. And if we go to page 659 --

7 MR. KURSMAN: And I will mark this as  
8 EXHIBIT 8, I believe.

9 (Thereupon, the Vuyk study was marked  
10 and filed as EXHIBIT 8.)

11 Q. Do you see it says at the very  
12 bottom, benzodiazepines lack analgesic properties and  
13 must be used with other anesthetic drugs to provide  
14 sufficient analgesic?

15 A. I see that, yes.

16 Q. Do you agree with that?

17 A. I disagree with that. Let me say  
18 this: I disagree basically what that sentence said,  
19 you know, it lacks analgesic properties. I think  
20 there's sufficient data out there to suggest that it  
21 has some analgesic properties, not nearly as much as  
22 opiates, for example, but some.

23 Q. Not nearly as much as opiates but  
24 some. How much?

25 A. Well, you cannot very easily make a

1 comparison and say, you know, it's a tenth of the  
2 analgesic potency of fentanyl, or morphine, or  
3 something like that. All I can tell you is that at  
4 some doses, relatively low doses, there are studies  
5 suggesting that or indicating that midazolam reduces  
6 pain levels, and so -- but I can't give you, you know,  
7 an exact number, like it's, you know, ten percent of  
8 what fentanyl would do or something like that.

9 Q. So just so I'm clear, this study that  
10 you cited in your report, you disagree with a  
11 conclusion?

12 A. I disagree with that. I disagree  
13 with that. I know this has been an issue. You know,  
14 there's several issues in these cases. They're very  
15 contentious and there's disagreement and I know this is  
16 one of them. But, again, the context here is that I  
17 would never use midazolam as an analgesic in clinical  
18 practice because we have much better drugs to use. I  
19 would never use 500 milligrams of midazolam. I  
20 wouldn't use midazolam as the only induction drug  
21 because we have much better drugs to use, but that  
22 doesn't mean that they don't have these -- the  
23 midazolam doesn't have these other effects.

24 Q. That article that we just looked at  
25 was in Miller's?

1                   A.           That is correct.

2                   Q.           Is that the preeminent textbook for  
3 anesthesia?

4                   A.           It is probably, if I were to say the  
5 most eminent book, it would be Miller. I have actually  
6 been an author on some chapter -- I mean some editions  
7 ago, but, yes. It doesn't mean I agree with everything  
8 that's in there, that everything is right, but it is a  
9 preeminent. So now you can say even Dr. Antognini says  
10 the book is -- you know, it has a statement in it, so  
11 you can put that in your whatever you use it for, you  
12 know, your statements and so forth.

13                  Q.           What should I put it in?

14                  A.           Whatever, you know, your complaints  
15 that you write and all that and so forth, so --

16                  Q.           Okay. Let's go to paragraph 14 in  
17 your report.

18                  A.           Okay. All right. Let's see, where  
19 should you put it? I think I just got your joke. I'm  
20 a little bit slow on the take here. Sorry, gentlemen  
21 and ladies. Okay. So my report. What paragraph?

22                  Q.           14.

23                  A.           Yes, I see it.

24                  Q.           Do you see it says, finally, the  
25 package insert clearly states that midazolam is

1 indicated for induction of general anesthesia?

2 A. Yes.

3 Q. Okay. So let's look back at the  
4 package insert again.

5 A. Yes.

6 Q. Pull that up. I'm going to share my  
7 screen. So is this what you're talking about under  
8 indications and usage where it says intravenously for  
9 induction of general anesthesia?

10 A. Yes.

11 Q. And then it says, though, before  
12 administration of other anesthetic agents?

13 A. Yes, I see that.

14 Q. Why didn't you include that second  
15 clause in your report?

16 A. So I probably should have. I have in  
17 the past. And so let's talk a little bit about that  
18 sentence there. It says intravenously for induction of  
19 general anesthesia before administration of other  
20 anesthetic agents. And I -- so I want to just go back  
21 to something here about the package insert and then  
22 we'll get back to that sentence. I was under the  
23 impression that the package inserts for a drug, whether  
24 it's made by one company or another, they all have to  
25 be the same, I thought. It said maybe prior to the

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1 administration of other anesthetic agents. This says  
2 before. But anyway, that's a minor point because it  
3 says before.

4 But let's look at that sentence or  
5 that -- it's not a full sentence there, but not so much  
6 from the scientific standpoint but just from the  
7 English language standpoint. So as indicated,  
8 intravenously for induction of general anesthesia. So  
9 what does induction mean? It means to start the  
10 process, to achieve the process of something, basically  
11 to induce sleep, et cetera. So the package insert says  
12 induction of general anesthesia. They're basically  
13 saying you can use this to induce general anesthesia,  
14 to achieve the state of general anesthesia. And then  
15 it says before administration of other anesthetic  
16 agents.

17 Now, if midazolam only produced  
18 sedation and deep sedation, did not produce anesthesia,  
19 it makes sense to me that the sentence would read  
20 something like intravenously for the induction of  
21 sedation before administration of anesthetic agents.  
22 The word other in this context means that midazolam is  
23 in a group of other anesthetic agents. If it wasn't an  
24 anesthetic agent, they wouldn't have used the word  
25 other. So, to me, the common interpretation of that



1 sentence is that they are including midazolam as  
2 another anesthetic agent, so --

3 Q. That's interesting. So you believe  
4 that because they use the term of other anesthetic  
5 agents, they are saying to you as an anesthesiologist  
6 that midazolam is an anesthetic, is that your  
7 testimony?

8 A. That is an interpretation of that  
9 sentence.

10 Q. You're an anesthesiologist. Do you  
11 know what midazolam is classified as?

12 A. It is classified as a sedative  
13 hypnotic.

14 MR. ATYIA: Objection to form.

15 Q. It's not classified as an anesthetic,  
16 is it?

17 A. It is not, to my knowledge. When I  
18 look at the package insert, I do not see it as that  
19 classification, but --

20 Q. Propofol, is propofol --

21 A. I'm not done yet. I'm not done yet.

22 Q. Go ahead.

23 A. Despite that, it basically can be  
24 used to induce general anesthesia and it has, you know,  
25 that word other in there. So, again, I don't -- you

1 know, in a clinical context, you wouldn't use midazolam  
2 by itself for a prolonged procedure, and we've already  
3 talked about previously, but -- and it's classification  
4 is it's not classified in the same class as maybe  
5 isoflurane, or propofol, or something like that. But  
6 that doesn't say anything about what the FDA believes,  
7 you know, in terms of you normally would use it for,  
8 and if they thought that it couldn't induce general  
9 anesthesia, then they probably would not have put that  
10 in there.

11 Q. I would like to continue on this  
12 because I find your reading of this interesting. So a  
13 second ago, you said to me that under indications and  
14 usages, because it says before administration of other  
15 anesthetic agents, that signals to you as an  
16 anesthesiologist that midazolam in and of itself is an  
17 anesthetic, right? Is that what you just said?

18 MR. ATYIA: Objection to form.

19 A. That would be one interpretation of  
20 that sentence. And I have said in my report and I've  
21 said in deposition before, I don't -- I think I've said  
22 it here today and certainly in testimony, you can give  
23 midazolam for the induction of general anesthesia. You  
24 follow that by a muscle relaxant and you can intubate  
25 somebody, and that's a very stimulating procedure. And

1 so in that setting, it is used basically as a general  
2 anesthetic to do that type of procedure. That's my  
3 opinion, that I've said that many, many times.

4 Q. I'm just asking you about this  
5 sentence. This is all I'm asking you about, this  
6 sentence without a filibuster, this sentence. When you  
7 see before administration of other anesthetics, are you  
8 telling me that that signals to you as an  
9 anesthesiologist that midazolam is an anesthetic?

10 MR. ATYIA: Objection to form.

11 A. That sentence by itself taken out of  
12 context may not signal to me as an anesthesiologist  
13 that the primary effect of midazolam at these doses is  
14 to be a general anesthetic, but, you know, based on the  
15 data that produced this and the data that produced the  
16 package insert, I should say, and the studies that were  
17 done with the use of midazolam as an induction of  
18 general anesthesia, then I believe that that statement  
19 says -- is correct that you give it for the induction  
20 for general anesthesia before the administration of  
21 other anesthetic agents. It's just that we wouldn't in  
22 the clinical setting use midazolam as a, quote, sole  
23 anesthetic for the, you know, reasons that we've just  
24 gone over. There's a difference between, you know,  
25 what a drug could do and what a drug -- you should be

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1 using the drug for. You know, some drugs have effects  
2 that you don't want to use it for that particular  
3 effect, but you use it for a different effect. It  
4 doesn't negate the possibility that it has these other  
5 effects.

6 Q. Are you aware that there are other  
7 drugs that are labeled anesthetics, classified as  
8 anesthetics?

9 A. Yes.

10 Q. And are you aware that midazolam is  
11 not one those drugs?

12 MR. ATYIA: Objection, form.

13 A. I don't know that -- I would have to,  
14 I guess, when you say that midazolam is not classified  
15 like that, I suppose you would have to produce to me  
16 a -- you know, what source you're looking at. I don't  
17 know off the top of my head and I suppose if we go to  
18 the FDA you could look up, you know, what anesthetic --  
19 what drugs are considered to be anesthetic or  
20 classified as anesthetics, I suppose, so --

21 Q. But let me understand this right.  
22 You wrote a report in this case on the use of midazolam  
23 and you don't know what midazolam is classified as?

24 A. No, I do. I said --

25 MR. ATYIA: Objection to form.

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1           A.           It's classified as a sedative  
2           hypnotic, I believe would probably be the best term  
3           there. And I'm a little bit unclear about that simply  
4           because how it's classified by, say, the FDA, the exact  
5           wording I may not have right, but it would be something  
6           similar to that. It would be an anxiolytic to stop  
7           anxiety and a sedative hypnotic.

8           Q.           So are you unaware of whether it's  
9           classified as an anesthetic?

10                   MR. ATYIA: Objection.

11           A.           I don't think it's classified an  
12           anesthetic.

13           Q.           Okay. Now, let's look at indications  
14           and usages again, which is up on my screen. It doesn't  
15           say that midazolam is indicated for the maintenance of  
16           general anesthesia, right?

17           A.           It does not, no.

18           Q.           There are other drugs, though, right,  
19           other drugs that have an indication and usages and some  
20           of those drugs are indicated for the maintenance of  
21           general anesthesia, right?

22           A.           As a general topic, yes, general  
23           statement, that is correct. I'm not sure it says that  
24           specifically in here, but that's true, yeah, there are  
25           other drugs we would use for maintenance.

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1 Q. Drugs such as halothane?

2 A. Halothane, yes.

3 Q. We can stop this. Let's go back to  
4 your report. Let's go to paragraph 16. And do you see  
5 you cite Bailey, et al.?

6 A. Yes.

7 Q. And what is the point of you citing  
8 Bailey, et al., in this paragraph?

9 A. Well, related to our earlier  
10 discussion around whether midazolam is -- can be fatal,  
11 this was a study that was done. It was a two-part kind  
12 of study. They were interested in the respiratory  
13 depression component of this discussion, this issue  
14 around does midazolam cause respiratory depression.  
15 And I believe they studied this in volunteers. And  
16 then collated or had data from the -- well, it says  
17 Department of Health and Human Services where there had  
18 been deaths in the United States that were reported to  
19 DHS and described circumstances where patients died as  
20 a result of midazolam administration.

21 Q. Why don't we take a look at Bailey.  
22 Do you have that in your --

23 A. I almost certainly do, so let me pull  
24 that up here. What page are you wanting to go to?

25 MR. KURSMAN: And we'll mark this as

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1 EXHIBIT 9.

2 (Thereupon, the Bailey study was  
3 marked and filed as EXHIBIT 9.)

4 Q. Let's go to page 830.

5 A. 830, okay.

6 Q. Do you see that very final paragraph?

7 A. Yes. The concluding paragraph? Yes.

8 Q. You see it says, our results  
9 demonstrate that midazolam when combined with an opioid  
10 is likely to place patients at high risk for hypoxemia  
11 and apnea, correct?

12 A. Yes, that's correct, that's what it  
13 says.

14 Q. This study is saying midazolam when  
15 combined with an opioid can cause death, right?

16 A. That's what the sentence says, but  
17 look at the data. Look at the data reported where they  
18 said some of these patients did not receive other  
19 drugs, which is what I said in my report.

20 Q. Now, let's take this down and let me  
21 ask you this: We were talking about fatal doses  
22 before. Do you think all drugs have a fatal dose?

23 A. I've already said never say never and  
24 never say always. But I am reminded of Paracelsus, who  
25 was a, you know, famous philosopher/scientist back in

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1 the 1500's, whatever it said. It's the dose that makes  
2 the poison. And you know, one dose of almost anything  
3 can kill you. So I would say, yes, there are drugs  
4 that, you know, very safe in general, but you can get a  
5 high enough dose and it can kill you. So can all drugs  
6 kill you? I would say probably, yes. I mean, I  
7 guess -- I mean, off the top of my head, I'm sure there  
8 are going to be some examples of maybe I'm a little bit  
9 off by that. But in general, if you give enough of a  
10 drug, it's going to have some effect of some sort that  
11 would kill a patient eventually.

12 Q. Well, I'm talking about fatal dose,  
13 because in your expertise, does the term fatal dose  
14 have a recognized definition in the medical community  
15 that you're aware of?

16 A. So, in general, a fatal dose would be  
17 one in which you would -- it's a dose that, you know,  
18 you would say on average or at this point you start to  
19 see people dying from it. You know, you have to be  
20 careful about how you define that. I mean, I have a  
21 general sense of a fatal dose. I have more of a sense  
22 of what's called lethal -- an LD50 or a lethal dose 50  
23 than a fatal dose. But I certainly have this  
24 understanding of fatal dose. It's not quite as, I  
25 think, well-defined, I suppose, as a lethal dose 50.



1 Q. And what is that definition that you  
2 believe it to be for a fatal dose?

3 A. For midazolam?

4 Q. No, just in general. What does the  
5 term fatal dose mean in the medical community?

6 A. It means a dose of a drug that would  
7 kill a patient, basically. But, again, it's -- you can  
8 take a drug and give it to 100 people and maybe at that  
9 dose it kills two people out of 100. Now, is that a  
10 fatal dose? Well, it certainly was for those two  
11 patients. What's your cutoff, you know, level here? A  
12 fatal dose is sort of a qualitative term because it's  
13 not quite as precise as LD50. So if I understand --  
14 now, maybe, you know, if you could elaborate about  
15 where you're leading with this, but I guess -- like I  
16 said, a fatal dose in the general medical community is  
17 going to be one where most physicians, I suppose, would  
18 recognize that at this dose, some people are going to  
19 die.

20 Q. And pentobarbital has a fatal dose,  
21 right?

22 A. The fatal dose is known.

23 Q. Right, the fatal dose is known. And  
24 the fatal dose of thiopental is known, right?

25 A. I would say probably yes. You know,

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1 again, you have to -- I'm going back to the paper that  
2 you brought up. You have to understand where those  
3 numbers come from. It's not so easy to say that, you  
4 know, it's known for thiopental, so I would concede or  
5 I would guess that, yes, it's probably known for  
6 thiopental as well.

7 Q. But it's not known for midazolam?

8 A. It is not, to my knowledge, it is not  
9 known for midazolam.

10 Q. Let's move to paragraph 18 in your  
11 report.

12 A. Okay.

13 Q. And do you see it says midazolam can  
14 clearly produce unconsciousness as defined by multiple  
15 investigators?

16 A. Yes.

17 Q. And you cite Glass, which we already  
18 talked about. And then you cite Kuizenga and Reves  
19 from 1978?

20 A. Yes.

21 Q. Do you have Kuizenga in your --

22 A. Yes. I'll pull it up real quick.

23 Q. And I'll share my screen in a second.

24 MR. KURSMAN: Mark this as EXHIBIT

25 10.

1 (Thereupon, the Kuizenga study was  
2 marked and filed as EXHIBIT 10.)

3 Q. Do you see it up on my screen?

4 A. Yes.

5 Q. So let's go to page 355.

6 A. Yes, I see it here.

7 Q. And if you go down to the last  
8 paragraph, do you see that?

9 A. Yes.

10 Q. It says, responsiveness was  
11 determined by testing the response of the patient to  
12 simple commands from a pre-recorded tape. And then in  
13 parentheses, raise your thumb, spread your fingers, and  
14 clench your fist, given by headphones every 30 seconds.  
15 The first time that the patient did not respond to a  
16 verbal command was registered. Do you see that?

17 A. Yes.

18 Q. At the time of loss of  
19 responsiveness. Do you see that?

20 A. Yes. Yes.

21 Q. So what Kuizenga is actually studying  
22 is responsiveness, not consciousness, right?

23 A. They are studying loss of  
24 responsiveness, as stated there, and they also say loss  
25 of consciousness elsewhere in their paper, but they are

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1 studying there or what they recorded, I guess, and  
2 reported would be the loss of responsiveness, which  
3 they define as being the loss of consciousness.

4 Q. And in Kuizenga, the subjects were  
5 not stimulated, right?

6 A. I do not believe they were. I do  
7 not -- I don't think so. I'm not sure about that,  
8 because it -- let's see. Give me a moment to see  
9 what's going on here. All right. I don't believe that  
10 they were being stimulated. It looks they had not  
11 received -- I don't think -- you're right, I don't  
12 think they were stimulated.

13 Q. They're just listening to the  
14 pre-recorded tape?

15 A. I believe that's correct, yes.

16 Q. Okay. Let's go to page 358.

17 A. Okay.

18 Q. And do you see under discussion, do  
19 you see where it says discussion?

20 A. Yes.

21 Q. You see it says, in this study, we  
22 demonstrated biphasic EEG effects for all the induction  
23 agents except midazolam.

24 A. Yes.

25 Q. And then if we go to 359.

1 A. Yes.

2 Q. Very last paragraph beginning with we  
3 conclude.

4 A. Yes.

5 Q. It says, we conclude that thiopental,  
6 propofol, etomidate, and sevoflurane, but not midazolam  
7 induced biphasic EEG effects during the transition from  
8 consciousness to unconsciousness. Do you see that?

9 A. Yes.

10 Q. So are they saying that subjects who  
11 received midazolam, the EEG doesn't give them an  
12 accurate reading when the subject moves from responsive  
13 to unresponsive?

14 A. I'm sorry, could you repeat that?  
15 I'm just scanning the rest of that -- part of that page  
16 there.

17 Q. Sure.

18 A. Could you repeat that?

19 Q. Are the authors saying that the EEG,  
20 at least when used with subjects who receive midazolam  
21 doesn't accurately reflect when they go from responsive  
22 to unresponsive?

23 A. I'm not sure that they say that  
24 because -- so that biphasic effect, and again, I  
25 probably should take some time to read this a little

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1 bit more thoroughly, but the biphasic effect is -- I  
2 believe they're defining it as being where there's, and  
3 I could be wrong, but -- let's see where there is --  
4 basically, what you do is you see this -- so going back  
5 to the discussion here, the beginning, it says,  
6 biphasic effects -- and so I'm at the beginning of the  
7 discussion at page 358 -- is an increase in alpha  
8 activity and beta activity followed by a decrease in  
9 alpha and beta activity and then simultaneously  
10 increase -- simultaneous increase in delta activity.  
11 So basically, when they use the term biphasic, it means  
12 that you see this sort of activation occurring and then  
13 this depression occurring. So that's biphasic effect  
14 is what they found with thiopental, propofol, and  
15 etomidate and sevoflurane, but not midazolam. That  
16 says nothing about whether, you know, midazolam  
17 produces unconsciousness or whatever. You know --

18 Q. Dr. Antognini, that wasn't --

19 A. I'm not done yet. Drugs, you know,  
20 differ in terms of effect one parameter but not  
21 another, so they're different EEG effects of these  
22 drugs. And so just because midazolam doesn't induce  
23 the biphasic effect says nothing about what it does for  
24 unconsciousness and so forth. And so, yeah, I mean,  
25 that's true what they say, I guess. You know, I

1 believe their interpretation, but it doesn't say  
2 anything about what midazolam does for unconsciousness.

3 Q. And I wasn't asking you about  
4 unconsciousness. All I was asking you about was its  
5 effects on the EEG.

6 A. Yeah.

7 Q. So you're saying you agree with that  
8 conclusion or have no reason to disagree with that,  
9 right?

10 A. I have no reason to disagree with  
11 that based on what I've seen.

12 Q. Okay. And you talked about  
13 consciousness. Do you agree that the authors didn't  
14 draw any conclusions as to whether midazolam can  
15 maintain anesthesia?

16 A. I do not remember. You know, I would  
17 have to look at their methods about what they did here.  
18 They obviously, if you look at just the figure, it  
19 looks like they used -- I'm guessing they used  
20 midazolam or they gave these drugs as an infusion, but  
21 I don't know for sure.

22 Q. Well, we just talked about the fact  
23 that they were measuring responsiveness and you agreed  
24 that's what this study was doing, measuring  
25 responsiveness to a pre-recorded tape, right?

1           A.           Well, that was one way -- that was  
2 just part of the study where they were looking at  
3 the -- they had to have some measure of the transition  
4 from consciousness to unconsciousness, so that's --  
5 they used that tape and those commands to do that.

6           Q.           And where midazolam was administered,  
7 could they draw any correlations on what the BIS score  
8 would be required to assume somebody was not  
9 responsive?

10          A.           So let's look at that data here. So  
11 in figure 3, they have -- what you see there basically  
12 are, I believe, individual -- yeah, these are  
13 individual patients. I'm focusing now on figure 3 at  
14 the bottom, the middle figure of that where it says  
15 midazolam and you -- what you see there are the lines  
16 basically representing the BIS number. And as time  
17 went on, these individuals became -- or lost  
18 responsiveness, and that's what the circles signify,  
19 although in the figure legend it says the moment of  
20 loss of consciousness, but they determine consciousness  
21 by the loss of responsiveness. So you asked about the  
22 BIS number. I think that's the data that you're -- I  
23 don't know. There might be other BIS data here, but  
24 that's the one that shows the BIS data basically  
25 relative to the loss of consciousness.



1           Q.           Let's go to -- let me stop this. And  
2           let's go to Reves, the other study that you cited for  
3           your proposition that midazolam can clearly produce  
4           unconsciousness. Do you have Reves, a 1978 article?

5           A.           I'm pulling it up now. Yes, I have  
6           it.

7                       MR. ATYIA: May I ask, Videographer,  
8           how much time or where we are on the time?

9                       VIDEO OPERATOR: Hold on one moment.

10                  MR. KURSMAN: Well, while you're  
11           doing that, let's go to -- I'm going to share  
12           my screen and let's go to --

13                  VIDEO OPERATOR: About five and a  
14           half hours.

15           Q.           Go to table -- do you see page 1,  
16           under table 1, do you see where my --

17           A.           Yes, I see it. I have it pulled up  
18           here, too.

19           Q.           Do you see it says, induction of  
20           anesthesia was defined as complete loss of lid reflex  
21           and failure to respond to oral commands?

22           A.           Yes.

23           Q.           So, again, this study is looking at  
24           nonresponsiveness, right?

25           A.           That is correct, yes.

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1 Q. And there was no painful stimuli  
2 applied, right?

3 A. To my knowledge, no, not in this  
4 particular study.

5 Q. And do you recall that there was, as  
6 part of this study, there was a post-visit follow-up  
7 where they discussed pain?

8 A. Yes, I -- well, I shouldn't say yes.  
9 I don't doubt you and we can look at that, but I  
10 don't -- I know that some of these studies had that, so  
11 we can look at that.

12 Q. Do you agree that midazolam is an  
13 amnestic?

14 A. Yes, it has that property.

15 Q. So if the subject was to receive  
16 midazolam and then have a post-visit follow-up to  
17 discuss pain, would they be able to recall that pain?

18 A. If they had an amnestic drug like  
19 midazolam, it's quite possible they would not recall  
20 that pain.

21 Q. We can take this down.

22 MR. KURSMAN: And that will be

23 EXHIBIT 11.

24 (Thereupon, the Reves study was  
25 marked and filed as EXHIBIT 11.)

1 Q. And then at the end of paragraph 18,  
2 you cite Nishikawa. Do you have Nishikawa?

3 A. Yeah. Let me just make sure. You  
4 mean Nishikawa?

5 Q. Nishikawa. I apologize.

6 A. That's fine. Sure. Okay. It's  
7 coming up. Yes, I have it here.

8 Q. This is a study on mice, right?

9 A. Yes.

10 Q. And it's a study about immobilizing  
11 the mice?

12 A. That is only one part of it, but --  
13 you know, it's about more than that, but that's one  
14 part of it.

15 Q. Well, let's go to the conclusion of  
16 this study on page 179.

17 A. Okay.

18 Q. Make sure I'm on the right page. Do  
19 you see, the present study provided in vivo evidence  
20 that genetic and pharmacological manipulations to alter  
21 ambient GABA concentrations have significant effects on  
22 the hypnotic and immobilizing actions of propofol and  
23 midazolam.

24 A. Yes.

25 Q. It does not say on the amnestic

1 effects of midazolam, right? Or, I mean, anesthetic  
2 effects, I apologize.

3 A. Yeah. It does not. But it says  
4 immobilizing actions of propofol and midazolam, so  
5 that's immobility.

6 Q. Are you aware of studies on any other  
7 animals that show midazolam can produce complete  
8 anesthesia?

9 A. I do not -- I have not found any  
10 other studies aside from this particular one. I'm sure  
11 if I had, I would remember, so -- I just don't know at  
12 this point. I don't recall.

13 Q. Have you seen studies that show  
14 midazolam actually cannot produce complete anesthesia  
15 on rats?

16 A. I have seen studies that have used  
17 midazolam, and again, you go up to a certain dose and  
18 you stop and say we didn't, you know, produce complete  
19 immobility at that dose. But again, it's a question  
20 of, well, if you had gone further, what would you have  
21 seen? So there are studies out there where they look  
22 at midazolam and I can't give them to you right now,  
23 but I'm pretty sure I've seen them where they give  
24 midazolam to look at the effects and at the highest  
25 dose that they study they did not produce complete, you

1 know, immobility based just solely on midazolam.

2 Q. And there are limitations to studies  
3 on mice, right?

4 A. Yes. There are limitations to all  
5 studies. I'm sorry, I keep on interrupting you, I  
6 apologize.

7 Q. Oh, no, that's okay.

8 MR. KURSMAN: And I'm going to mark  
9 this as EXHIBIT 12.

10 (Thereupon, the Nishikawa study was  
11 marked and filed as EXHIBIT 12.)

12 Q. So let's go back to your report and  
13 let's go now to paragraph 19. So we talked about  
14 Glass. Now let's talk about Antonik, which you cite in  
15 paragraph 19. Do you have Antonik?

16 A. Yes. So go ahead and tell me where  
17 you want to go with that one and let me just pull it up  
18 while you're doing that.

19 Q. Take your time.

20 A. It's coming up now. Okay. I have it  
21 here, so --

22 Q. Let me pull it up and I will share my  
23 screen.

24 A. Okay.

25 Q. Do you see it on my screen?

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1 A. Yes.

2 Q. Now, if we go to page -- the second  
3 page of Antonik, which would be --

4 MR. KURSMAN: And this is EXHIBIT 13.

5 (Thereupon, the Antonik study was  
6 marked and filed as EXHIBIT 13.)

7 Q. Which would be page 275. Do you see  
8 table 2? They're using the MOAA/S scores.

9 A. Yes.

10 Q. And so for a score of 2, it says,  
11 responds only after mild prodding or shaking, right?

12 A. Yes.

13 Q. And you would get a 1 if you  
14 responded after a trapezius squeeze.

15 A. Yes.

16 Q. So let's go to page 278.

17 A. Okay. Okay.

18 Q. And do you see it says, in this  
19 cohort experienced -- six of ten subjects in this  
20 cohort experienced loss of consciousness, and they have  
21 MOAA/S scores of less than 2.

22 A. I'm sorry, could you show me -- oh,  
23 yes, I see it here. Yeah, I see it here.

24 Q. Do you see it?

25 A. Yes.

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1 Q. Okay. So if you respond to a painful  
2 trapezius squeeze, according to this study, you are  
3 unconscious, right?

4 A. Yes.

5 Q. And now let's go to table 4, which is  
6 right at the top. Do you see it?

7 A. Table 4, I see it, yes.

8 Q. And do you see it says, the mean, the  
9 mean blood levels right here, nanograms per milliliter,  
10 the second column over?

11 A. Yes. Yes.

12 Q. And you see for midazolam, it says  
13 1,554 nanograms per milliliter, do you see that?

14 A. Yes.

15 Q. And now if we go to figure 4, so the  
16 mean amount of midazolam in the subject's blood were  
17 1,554 nanograms per milliliter, right?

18 A. Yes.

19 Q. Now, let's go to figure 4, and that  
20 will be on page 280.

21 A. 2-8? What?

22 Q. 280.

23 A. 280, okay. All right.

24 Q. And do you see this midazolam?

25 A. Yes.

1 Q. And do you see the chart at the  
2 bottom?

3 A. Yes.

4 Q. Okay. So even though the mean levels  
5 of blood in the subjects of midazolam, the mean  
6 midazolam in the blood was 1,554 nanograms per  
7 milliliter, many of the subjects responded to a  
8 trapezius squeeze, right?

9 A. Yes.

10 Q. And for BIS levels, I think you said  
11 at the beginning you thought the BIS was the most  
12 important mechanism to look at consciousness. What do  
13 you think is sufficient in terms of a BIS reading to  
14 ensure that a person is unconscious who has received  
15 midazolam?

16 A. Generally, the range for  
17 unconsciousness is going to be -- I know you have  
18 quibbled about what unconsciousness means, but for the  
19 lack of a trapezius squeeze, we're probably talking of  
20 a, my guess, of a BIS number of maybe 60 to 70, I  
21 suppose. I don't know off the top of my head.

22 Q. And what about when you use the term  
23 deeply unconscious? I'm not sure that I could --

24 A. I used the term what?

25 Q. Deeply unconscious.



1           A.           Deeply unconscious. It's probably  
2 lower than -- it's going to be a BIS of maybe 40 to 60.  
3 That's the general range that we would attempt to  
4 achieve with -- the general range we attempt to achieve  
5 for general anesthesia during a clinical case.

6           Q.           Okay. So let's go to page 282 now.

7           A.           Okay.

8           Q.           Which is --

9           A.           Okay.

10          Q.           And do you see at the bottom the  
11 midazolam BIS scores?

12          A.           Yes.

13          Q.           Do you see that no subject who  
14 received midazolam had anywhere close to a BIS score of  
15 60?

16          A.           So you're looking at the figure there  
17 of midazolam?

18          Q.           Do you see where it says BIS scores  
19 on the side?

20          A.           Yeah. You're looking at figure 5,  
21 correct?

22          Q.           Figure 5, that's right.

23          A.           Yes. So the lower portion of figure  
24 5.

25          Q.           Yes.

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1                   A.           Lower right, I should say.

2                   Q.           Midazolam.

3                   A.           Okay. Well, these are data reported  
4 as the medians plus or minus interquartile range of  
5 n = 18 for midazolam. So these don't represent all the  
6 individuals. So if you look at some of those bars,  
7 basically, especially at the lowest point, which is  
8 maybe a few minutes after the midazolam has been given,  
9 the lowest bar there, the error bar, basically, is at  
10 around 68, maybe 67. That doesn't represent all  
11 patients. There's going to be some variations. So  
12 some patients -- some of these individuals probably  
13 were below 60 just based on the amount of spread of  
14 that error bar.

15                  Q.           Okay. And we know the mean in  
16 nanograms per milliliter for these subjects was 1,554  
17 nanograms per milliliter of midazolam in their blood,  
18 right?

19                  A.           So I'm going to -- I have to admit  
20 maybe a little bit of egg on my face that that 1,554  
21 number, I'm surprised it's that high, I really am,  
22 based on the dose of the drug that was given. But  
23 that, you know, may be a correct number, but I'm  
24 surprised it's that high. But I don't deny the fact  
25 that it says 1,554.

1 Q. Would that be a high level of  
2 midazolam to have in your blood?

3 A. It would, yes.

4 Q. And do you see that in this same  
5 figure, figure 5, the mean of the BIS score is still  
6 well above 70, even at its lowest point?

7 A. Yes.

8 Q. And these were subjects who received  
9 no stimulation whatsoever?

10 A. I do not believe that they did,  
11 except for the --

12 Q. Except for the tape?

13 A. No. Well, no, because remember these  
14 are individuals that were given the sedation scale. I  
15 mean, they were subjected to the sedation scale. So,  
16 you know, at some point, they had to be -- you know, a  
17 name called out, they had to be, you know, prodded or  
18 shaken, some of them received a trapezius squeeze, so  
19 they did receive some stimulation by virtue of the fact  
20 that they had to measure the sedation score.

21 Q. So, in your opinion, is the  
22 stimulation that they received was -- was at the time  
23 they were assessing the sedation score, right?

24 A. Yeah. As far as the BIS number is  
25 concerned, my guess is that they probably recorded the

1 BIS number before stimulation. That's usually the way  
2 that these types of studies are done. But I don't know  
3 for sure, I would have to look at the study.

4 Q. Well, I do, so we can go to that. So  
5 let's go to page 275.

6 A. Okay.

7 Q. It says, during this study, sedation  
8 was measured by BIS monitoring. The confounding  
9 effects of stimulation producing movements were  
10 mitigated by recording the BIS value immediately before  
11 the MOAA/S assessment, right?

12 A. Yes, I see that.

13 Q. Okay. So these patients had a mean  
14 of 1,554 nanograms per milliliter of midazolam in their  
15 blood and still the mean was above 70 on their BIS  
16 score even before any stimulation, right?

17 A. Okay. So let's just go back to that  
18 table so I can look at that number again.

19 Q. Sure. I'll pull it up for you. Here  
20 it is, table 4.

21 A. Yes, I see it here.

22 Q. Okay.

23 A. Okay. All right. So if you want to  
24 repeat your question.

25 Q. Sure. So the mean blood level of --

1 the mean level of midazolam was the 1,554 nanograms per  
2 milliliter in these subjects and their mean BIS reading  
3 with that blood level was about 74 or so, right, based  
4 on the chart that we just looked at?

5 A. Yes.

6 Q. Okay. And this was before any  
7 stimulation whatsoever, right?

8 A. Yes.

9 Q. And the authors of this study looked  
10 at the BIS before stimulation because they were  
11 concerned that stimulation in and of itself can raise  
12 the BIS, right?

13 A. Yes.

14 Q. Okay. So one would expect that if  
15 they were prodded or if they received a trapezius  
16 squeeze, that BIS score would have went up, right?

17 A. Yes. All right. So now I'm going  
18 to -- now that I've had a better look around in this  
19 paper and saw the 1,554, so the 1,554 number that you  
20 are focused on is the C max or basically the highest  
21 plasma concentration that was measured. And they also  
22 report just directly next to it the T max, which is  
23 they state is the time of maximum plasma concentration.  
24 So I don't know, I would have to again look at the  
25 methodology about how they arrived at that number. But

1 one of the things that we have to be very careful  
2 about, this is a study that was done where you gave a  
3 bolus of midazolam and it was .075 milligrams per  
4 kilogram, that works out to be in 70 kilogram adult  
5 about 5 milligrams in an adult would 7.5 milligrams and  
6 they gave that as a bolus. I don't know over what  
7 period of time.

8 But drugs such as midazolam have this  
9 lag effect where you can measure a peak effect or a  
10 peak drug level that doesn't necessarily correspond to  
11 what you see clinically, because it takes time for that  
12 drug to cross over into the brain. So that's different  
13 than what was done in, for example, the Glass study.  
14 And it would be different than what you were talking  
15 about with those autopsies where they were measuring  
16 it. It's a very -- you know, it's not as clean cut as  
17 I think you're trying to make it here. But all I can  
18 say is that I am surprised it was 1,554. I wish  
19 they -- maybe they did. Let me just look and see here.  
20 The report would actually have the -- they are  
21 remimazolam here. I don't know that they show the  
22 midazolam concentrations here at all, but that's too  
23 bad. I don't see that they show that. But I guess my  
24 point is that you have to be careful about using that  
25 number 1,554 in trying to correlate it with, you know,

1       some of the effects that they saw and so forth. So  
2       I'll just leave it at that.

3               Q.           In a hospital setting where there is  
4       a BIS machine, is the BIS continually monitored during  
5       surgery?

6               A.           It should be, yes. Usually it would  
7       be, yes.

8               Q.           And is the reason for that that you  
9       want to monitor the patient's level of sedation during  
10      the surgery?

11              A.           Yes, or level of anesthesia or  
12      sedation, yes.

13              Q.           And would it be unhelpful if you  
14      stopped monitoring the patient's level of sedation  
15      during surgery?

16              A.           Would it be unhelpful? Yes, it would  
17      be unhelpful. It wouldn't be doing the patient a  
18      benefit if you just stopped monitoring them.

19              Q.           And it could actually cause the  
20      patient a lot of harm, right?

21              A.           That is correct, yes.

22              Q.           If you were unaware whether the  
23      patient was conscious or not during surgery?

24              A.           That is correct, although, again, no  
25      monitor is perfect in terms of knowing whether somebody

1 is conscious or not during the anesthesia and surgery.

2 Q. Sure. But do you agree that the more  
3 things that you can do to monitor the consciousness  
4 level is helpful to reducing that pain during surgery?

5 A. Yeah. You know, generally speaking,  
6 I think that's a true statement in a clinical realm.

7 Q. Well, why are you qualifying it in a  
8 clinical realm?

9 A. Well, so some of the things that we  
10 look for in the operating room such as increases in  
11 blood pressure, increases in heart rate, salivation,  
12 the tearing, and so forth that we've talked about,  
13 movant responses, these are helpful in terms of us  
14 determining whether somebody, you know, their level of  
15 anesthesia and so forth, but it's still a possibility  
16 that somebody could have consciousness if the  
17 anesthetic is really low and we're seeing that. So I  
18 guess my point is that the -- you can't put that all  
19 together and still have a hundred percent certainty  
20 answer that, you know, somebody is conscious or not.

21 Q. Sure. My only question, though, is  
22 it helps, each one of those helps the people who are  
23 monitoring consciousness, right? Each one of those  
24 different mechanisms helps.

25 A. If you know how to interpret the data



1 and all that, yeah, you know, like I said, it does  
2 help, but it's certainly not a guarantee and it's not  
3 used all the time by a lot of anesthesiologists to do  
4 that.

5 Q. Is there ever a time in a hospital  
6 setting where a patient receives a paralytic and then  
7 there is no monitoring whatsoever by machine?

8 A. By?

9 Q. Machine, meaning EEG, BIS, et cetera.

10 A. And you said something like  
11 vecuronium given by itself?

12 Q. No, not vecuronium given by itself.  
13 After vecuronium is given in a surgical procedure,  
14 would there ever be a time where a patient isn't  
15 monitored by machines?

16 A. And you mean machines like blood  
17 pressure machines and nothing else?

18 Q. That is what I mean.

19 A. I see, okay. In the clinical  
20 setting, no, I don't think you would ever see that.  
21 You would always have blood pressure, heart rate  
22 monitors and so forth. Obviously, you would have a  
23 ventilator on the patient, so you would have all those  
24 machines.

25 Q. Isn't that because you would want to

1 know what's going on with the patient?

2 A. Yes. You use that information to  
3 assess the patient for a variety of different outcomes,  
4 bad outcomes, or just the effects of the drugs that  
5 you're giving and what's occurring clinically.

6 Q. And if you didn't monitor that  
7 patient, you could dramatically increase their risk of  
8 pain, right?

9 A. No, I'm not sure I would say  
10 dramatically increase. I think that the -- I'm trying  
11 to think of how you, you know, in the clinical realm, I  
12 guess, we use these machines basically for a variety of  
13 different reasons in somebody -- you know, somebody who  
14 has received vecuronium, let's say, in the operating  
15 room or in the intensive care unit, you know, we use  
16 more or less the same types of machines, blood  
17 pressure, heart rate, and all that. And yes, we use  
18 that information to understand -- to incorporate that  
19 information in our assessment of whether the patient is  
20 conscious or not. I don't -- you know, we also use  
21 that information for other reasons, but, you know,  
22 relative to consciousness and so forth, yes, we would  
23 use that information in basically an algorithm of  
24 deciding what is the probability that somebody might be  
25 conscious or not.

1                   Q.           Well, if there's no paralytic given  
2                   to a patient, you can look at a patient's movements and  
3                   reactions, right?

4                   A.           Yes.

5                   Q.           And that helps determine level of  
6                   sedation, right?

7                   A.           Yes.

8                   Q.           But once the paralytic is given, you  
9                   can no longer do that, right?

10                  A.           That is correct, you cannot do that  
11                  anymore.

12                  Q.           So if you took all the machines away  
13                  once the paralytic is given, you would essentially  
14                  being, for lack of a better term, flying blind in terms  
15                  of level of anesthesia, right?

16                  A.           Yes, although I would say even with  
17                  all those machines, you wouldn't -- you would be flying  
18                  with only -- with one eye closed and the other one, you  
19                  know, just barely open, because, you know, that -- as  
20                  Dr. Van Norman has so -- you know, has put it, even  
21                  with all these machines, we still don't know whether  
22                  people are conscious or not sometimes, so --

23                  Q.           And do you agree with that?

24                  A.           Well, you know, one thing that I do  
25                  agree, and I don't know how my colleagues in Tennessee

1 are going to think about this, my answer, but I'm going  
2 to put it out there because it's -- you know, I'm going  
3 to testify truthfully about -- and I'll give you --  
4 I'll set this scenario up. I'll set it up in sort of a  
5 hypothetical scenario, which is that when we give these  
6 anesthetic drugs and they produce unconsciousness based  
7 on -- and they're not -- you know, let's not quibble  
8 about what that term means, but just they produce  
9 unconsciousness from an observer perspective that  
10 there's no response to verbal stimulation, there's no  
11 response to painful stimulation. Then the -- and the  
12 patient has no memory of that and, you know, you talk  
13 to them afterwards and say, well, do you remember  
14 anything about what happened during the operation? And  
15 they say no. And from your clinical perspective, you  
16 know, they were not responsive to stimuli.

17 And let's assume for the moment we're  
18 not talking about someone who has been given  
19 vecuronium, just an anesthetic drug. So they didn't  
20 respond to surgical stimulation and they have no memory  
21 of anything. So how do you know that the person was  
22 really unconscious? You know, if they don't remember  
23 it and they didn't respond, you know, how do you know?  
24 That's a philosophical -- almost a philosophical  
25 dilemma because you cannot test that hypothesis. It's

1 not a testable hypothesis because that situation  
2 prevents understanding or knowing, you know, whether  
3 somebody had awareness during that period. We have to  
4 rely basically on our understanding of these drugs.

5 Now, on the flip side, you know, we  
6 may not know whether they're conscious, but we also  
7 don't -- we may not know whether they're unconscious.  
8 You cannot have it both ways. You know, Dr. Van Norman  
9 can't say, well, you know, they could be conscious and  
10 I can't say they are unconscious because -- in that  
11 scenario I'm talking about, because there's no way to  
12 test that hypothesis based on the way I set that up.  
13 That is a dilemma.

14 Q. Right. And I understand that and I  
15 appreciate that. The vecuronium, that would mask signs  
16 of consciousness if they were conscious enough to  
17 respond?

18 A. That is true.

19 Q. So if the Tennessee Department of  
20 Corrections asks you which way you thought would be the  
21 more humane way to execute an individual with  
22 vecuronium -- with midazolam followed by potassium  
23 chloride or midazolam followed by vecuronium bromide  
24 followed by potassium chloride, what would your answer  
25 be?

1 MR. ATYIA: Objection to form.

2 A. I would not make any comment or  
3 answer that question. And I have asked -- I have been  
4 asked that question, not, I think, in Tennessee, but --  
5 and not in deposition, but just in discussions with  
6 other states and other people involved with this. I  
7 don't make any opinions about whether it's humane or  
8 not. That's -- come on, that is a judgment question  
9 that is -- I think that anybody could answer for, you  
10 know, for themselves. You know, what is a humane way?  
11 You know, what is humane for me may be different than  
12 for you. So I'm not -- I don't tell or say to a state,  
13 well, if you followed this protocol, it would be more  
14 humane than if -- and I don't mean this Tennessee  
15 protocol, but if you follow this hypothetical protocol  
16 A, it's more humane than, you know, hypothetical  
17 protocol B. I don't make those types of statements.

18 Q. And I appreciate that. And I used a  
19 poor choice of words. What if they asked you which  
20 protocol would greater ensure that the prisoner would  
21 be unconscious and that we could monitor the prisoner  
22 for being unconscious if we gave just midazolam and  
23 then potassium chloride or midazolam, vecuronium  
24 bromide, and then potassium chloride, what would you  
25 tell them?

1 MR. ATYIA: Object to form.

2 A. Which of those protocols would allow  
3 you to be better at detecting consciousness? I think  
4 you said or is that what you said?

5 Q. Yes.

6 A. Okay. The protocol that -- so most  
7 of these protocols, clearly then Tennessee, and I'm  
8 just going to focus on Tennessee now because that's  
9 what I'm testifying to, is the Tennessee protocol, you  
10 know, they have a consciousness check there. So they  
11 do test for consciousness, most of these protocols do.  
12 In fact, I think all of them do, although I haven't  
13 seen all of them. So whether you have a protocol that  
14 is one that excludes vecuronium or includes vecuronium,  
15 they would include a consciousness check. So that to  
16 me is what you would want to have in a protocol, not  
17 whether you state that vecuronium is going to hide  
18 something.

19 Q. Well, you and I just discussed a  
20 minute ago that noxious stimuli can both increase the  
21 BIS and increase your level of anesthetic depth,  
22 meaning it can raise it, right? If you are sedated and  
23 then you get a trapezius squeeze, for instance, you  
24 might then awaken, right?

25 A. Yes.

1 Q. So in Tennessee, are you aware that  
2 the consciousness check happens before any noxious  
3 stimuli?

4 A. Well, my understanding that the --  
5 oh.

6 Q. I apologize. Are you aware that it  
7 happens before the vecuronium bromide?

8 A. Yes.

9 Q. And you're obviously aware it happens  
10 before the potassium chloride?

11 A. Yes.

12 Q. Okay. So do you not think it would  
13 be helpful that after the consciousness check for  
14 Tennessee to be able to continue to monitor the  
15 inmate's consciousness by just administering potassium  
16 chloride after the midazolam?

17 A. And so let's talk about -- I will say  
18 my opinion about what you would expect to see if you  
19 were to have a protocol of midazolam with potassium  
20 chloride as opposed to midazolam, then vecuronium, and  
21 then potassium chloride.

22 Q. That's not my question, though. I  
23 mean, my question is a pretty simple question, which is  
24 not what you expect to see. It's if Tennessee wants to  
25 continue to monitor an inmate's consciousness during



1 the entirety of the lethal injection procedure,  
2 wouldn't it be helpful to start with midazolam and then  
3 inject the potassium chloride?

4 A. Okay. I was trying to answer your  
5 question.

6 MR. ATYIA: Object to form.

7 A. I have to give you the context here,  
8 you know, and because I want -- as I said, what I would  
9 expect to see. If you gave midazolam and then gave  
10 potassium chloride, it's quite possible that you would  
11 see a reflex withdrawal of that extremity because it  
12 is, you know, as we've discussed, and I have said and  
13 everyone agrees that potassium chloride when given  
14 intravenously is a noxious stimulus, so I would expect  
15 there to be a withdrawal reflex from that or a movement  
16 of that arm where it's being injected, which I believe  
17 would be, could be a withdrawal reflex. And then, you  
18 know, would that be sufficient to raise the level of  
19 consciousness of the inmate to the point that the  
20 inmate would be basically conscious and awake? I do  
21 not think so based on the totality of the studies and  
22 so forth that I've pulled together. I do not think  
23 that would be likely. But at that point, you know, the  
24 potassium chloride goes in and then there's cardiac  
25 arrest and then the inmate dies. So there wouldn't be

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1 a practical way of using that information.

2 So let's do a -- you know, let's do  
3 sort of a thought experiment on this. You know, let's  
4 say that a state did use a protocol with midazolam and  
5 just potassium chloride and they go through some of  
6 these executions and, you know, you see this movement  
7 of the arm that is essentially a withdrawal reflex.  
8 Now, you know, again, I'm -- I don't know exactly what  
9 would happen, but I suspect that you would see arm  
10 movement because of this, again, possibly withdrawal  
11 reflex. You may not see it. But let's assume for the  
12 moment that you do. On the one side, you could say,  
13 well, that's something that happens during anesthesia.  
14 Even at the ASA table that you brought up earlier says  
15 that a withdrawal reflex is not considered purposeful  
16 movement. I believe that was in that table. I mean, I  
17 know it's in that table, but I don't know that we  
18 actually talked about that. But in any case, a  
19 withdrawal reflex does not mean that it's purposeful  
20 movement.

21 But you know, there are a lot of  
22 people that would say, oh, my goodness, you know, the  
23 inmate is moving. That doesn't indicate that the  
24 inmate is awake. By ASA's definition, a withdrawal  
25 reflex is considered to be a non-purposeful movement.

1       So you would ask me -- you've asked me about wouldn't  
2       it be better in terms of monitoring their level of  
3       consciousness than -- I don't know. I suppose in that  
4       scenario that the potassium chloride was sufficiently  
5       noxious that even despite the 500 milligrams of  
6       midazolam, the inmate basically opened their eyes and  
7       screamed out, you know, would that be considered to be  
8       conscious? I suppose, yes, you could say that. The  
9       inmate came -- went from a low -- or a deeper level of  
10      anesthesia, so up to a higher level to the point of  
11      being -- having spontaneous vocalizations and so forth,  
12      so is that scenario possible? Yes, it is. I don't  
13      think that -- I think that the dose of midazolam that's  
14      given would prevent that, but we don't have those data  
15      for obvious reasons, so --

16               Q.           If you think that the dose of  
17      midazolam would prevent that, what is your expert  
18      opinion as to the purpose of vecuronium bromide?

19               A.           I do not know why the -- a state uses  
20      vecuronium. Again, I --

21                       MR. ATYIA: Object to form.

22               A.           As I've said before, you put these  
23      protocol -- you know, states provide these protocols  
24      and I can say this is -- you know, this is what I  
25      expect, so -- they haven't told me, you know, no state

1 to my recollection has said, you know, why did we  
2 include vecuronium? And obviously, it probably goes  
3 back to the first lethal injection protocol where they  
4 just said this is, you know, what we're using, so --

5 Q. When you give potassium chloride in  
6 the operating room when a patient is under general  
7 anesthesia, is there normally a withdrawal reflex?

8 A. There is not.

9 THE WITNESS: May we take a one  
10 minute break?

11 MR. KURSMAN: Sure.

12 THE WITNESS: My dog is licking  
13 herself.

14 MR. KURSMAN: How about we do a ten  
15 minute break.

16 THE WITNESS: Okay. That's fine.  
17 Thank you.

18 VIDEO OPERATOR: Going off the  
19 record. The time is 4:29.

20 (Brief recess.)

21 VIDEO OPERATOR: Back on the record.  
22 The time is 4:39.

23 MR. ATYIA: All right. Thanks, Alex.  
24 I'm just going to get on the record very  
25 quickly. I'm going to have some questions for

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1 Dr. Antognini and I asked the court reporter,  
2 he says you've got like about 43 minutes left.  
3 And I know that you may have -- or you may want  
4 to do -- reexamine Dr. Antognini after my  
5 questions, so I just wanted to give a heads-up.

6 MR. KURSMAN: Okay. Just so you're  
7 aware, Dean, I will get additional time over my  
8 seven hours if you ask questions.

9 MR. ATYIA: Is that right?

10 MR. KURSMAN: That is right.

11 MR. ATYIA: I'm not aware of that, so  
12 I don't know that I can agree to that. I'm not  
13 aware of -- I think you have seven hours.

14 MR. KURSMAN: Okay. Well, if my  
15 seven hours are up and you want to ask  
16 questions and then not allow me to ask  
17 questions after, we can take that up with the  
18 Court.

19 MR. ATYIA: I'm not saying -- that's  
20 why I'm giving you notice. And I'm saying,  
21 hey, I'm going to have questions. But maybe we  
22 can agree now of some reasonable scope because  
23 he's been here for almost seven hours and I  
24 appreciate your right to ask him after I ask  
25 him, but what I'm asking you is, I don't think

1           that's balance. And I would say that seven  
2           hours is seven hours. But, sure, if you want  
3           to ask him more redirect, but I don't think we  
4           need to take up with the Court to agree on some  
5           reasonable limitation to your redirect.

6                       MR. KURSMAN: Okay. Well, why don't  
7           I go until my seven hours and then we can  
8           discuss.

9                       MR. ATYIA: Sure.

10           Q.           While we were off the record, did you  
11           talk with anybody?

12           A.           Yes. My wife came back and we talked  
13           about the dog and the vet.

14           Q.           Okay. How's the dog doing?

15           A.           You know, okay. I mean, she's still  
16           scratching and licking herself, so --

17           Q.           Okay. Sorry about that. So when we  
18           left, as we were leaving, you said when potassium  
19           chloride is given in an operating room, normally  
20           there's no withdrawal reflex, right?

21           A.           Most of the time that we give  
22           potassium chloride in the operating room, the patient,  
23           of course, would be anesthetized and would be possibly,  
24           you know, a drug like vecuronium on board, so, you  
25           know, you wouldn't be able to see withdrawal reflex

1 even if there was an attempt to do that.

2 Q. What if there was no vecuronium on  
3 board in the operating room, is there a withdrawal  
4 reflex when you've administered potassium chloride?

5 A. No, I don't think so, not in my  
6 recollection.

7 Q. So why do you think there would be a  
8 withdrawal reflex in the lethal injection context?

9 A. Well, because any time you apply a  
10 noxious stimulus to an extremity, in this case we're  
11 talking about an arm, you can get a withdrawal -- I  
12 shouldn't say any time. There's a possibility that you  
13 could get a withdrawal reflex, so it just -- you have  
14 to recognize that possibility.

15 Q. Right. I understand that there is a  
16 possibility, but do you think it's probable that a  
17 withdrawal reflex would happen in a lethal injection  
18 context after 500 milligrams of midazolam?

19 A. I'm not sure I can, you know, assign  
20 a probability to it. I really don't know. Again,  
21 we're talking about -- obviously both, on both sides,  
22 there is some speculation here as to what occurs with a  
23 500 milligram dose of midazolam, so I'm not sure I  
24 would assign a probability to that. I wouldn't feel  
25 comfortable, I guess.

1 Q. You just told me that in the  
2 operating room when vecuronium or rocuronium is not  
3 applied and a patient is under general anesthesia, when  
4 they receive potassium chloride, there is usually not a  
5 withdrawal reflex, right?

6 A. That's true. But we're not giving  
7 the dose of potassium chloride that's contemplated in  
8 the protocol.

9 Q. And do you believe the withdrawal  
10 reflex would be because of the high dose of potassium  
11 chloride in the protocol?

12 A. Yes. Basically if you have a high  
13 enough -- if you give a very low dose at a low speed,  
14 it's going to be less irritating. Give a higher dose  
15 at a higher speed, then it's going to be more  
16 irritating, so I think you would increase the  
17 probability of a withdrawal reflex.

18 Q. Okay. Now, let's go to page 32 of  
19 your report, page 32. And let me know when you get  
20 there.

21 A. Page 32?

22 Q. Yes. Do you see it says statements 5  
23 and 6, the consciousness checks outlined?

24 A. Yes.

25 Q. In the Tennessee protocol are

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1 sufficient to determine unconsciousness and are  
2 commonly used in a clinical setting. All right. When  
3 you say this, are you just talking about a trapezius  
4 squeeze?

5 A. I would have to refer to the  
6 protocol. When I wrote that -- as I sit here today, I  
7 don't recall what the protocol says about the  
8 consciousness checks, what they are, so --

9 Q. Well, what do you think would be a  
10 sufficient consciousness check in this context?

11 A. I think it could be a combination of  
12 different things, but it would include -- should I  
13 think, or usually should include a verbal stimulus of  
14 some sort, a tactile stimulus, and then a painful  
15 stimulus, so a sternal rub, for example, or a pinching  
16 of the skin of extremities, or something of that  
17 nature. You might include a -- sort of an eyelash  
18 reflex or a touching of the cornea. Those would be the  
19 ones that I would think that you would want to include.

20 Q. Do you think the person who is  
21 performing the consciousness check should be trained on  
22 signs of distress?

23 A. I'm not sure what you mean by  
24 distress. That's not something that -- I mean, I know  
25 what the word means, but -- yeah, I think that the

1 person should know what to look for in terms of some  
2 type of response with these stimuli.

3 Q. Okay. And if during the  
4 consciousness check the inmate moves their fingers,  
5 would be that indicative of the inmate being conscious?

6 A. Not necessarily. If there was, you  
7 know, spontaneous, again, occur during (inaudible) and  
8 so, you know, in response to a stimulus, you might see  
9 some finger movements. You know, if it's a painful  
10 stimulus, you could see -- you know, especially if it's  
11 the stimulated extremity, so finger movements by  
12 themselves may not indicate that the individual is  
13 conscious.

14 Q. But if you were doing the  
15 consciousness check and you performed a trapezius  
16 squeeze and the inmate moved their fingers, would you  
17 determine at that point that they were not conscious?

18 A. It depends on how much finger  
19 movement that occurs. If there's just a small amount,  
20 and again, I can't really define it, I can sort of see  
21 it, but if it's a small amount, I might not -- I might  
22 conclude that there's -- you know, it's not a  
23 big amount, big enough that I'm worried about the  
24 person being conscious.

25 Q. And when you say you would have to

1 see it, do you think you have a greater amount of  
2 expertise than the person who's doing the consciousness  
3 check in Tennessee execution procedures?

4 MR. ATYIA: Object to form.

5 A. Not knowing, you know, who is in  
6 there in Tennessee, although I believe, and correct me  
7 if I'm wrong, I believe the warden is the one doing  
8 this, so -- I don't know what this warden's training  
9 is. I doubt that they are a physician or, you know, in  
10 the medical field. So I would hope that I would have a  
11 better feeling for these things than he would because  
12 I'm a doctor and I've been a doctor for many, many  
13 years, so I hope that training and education of mine  
14 has come to some use.

15 Q. And what if the inmate, when you were  
16 performing a consciousness check, what if they blinked  
17 their eyes during the consciousness check, would that  
18 be indicative of consciousness?

19 A. And this would be to what type of  
20 stimulus?

21 Q. To any of the stimulus you just  
22 outlined.

23 A. I see, yes. Let me think here for --  
24 so I would say, you know, probably yes, that would  
25 be -- I would be concerned about their level of

1 consciousness if they had an eyelid blinking response  
2 to the stimuli that I have specified. The eyelid  
3 response is sort of similar to the finger response. It  
4 probably doesn't mean that the person is conscious,  
5 especially, you know if it's -- I would expect it to be  
6 more than that. But, you know, you're setting up a  
7 scenario here where, you know, maybe you're building up  
8 to more and more different type of responses, and  
9 again, you have to consider all the different things  
10 that are occurring here and what you see to figure out,  
11 okay, am I confident this person is conscious or not?

12 Q. What about if they open their mouth?

13 A. Well, obviously, if they open their  
14 mouth to a verbal stimulus, for example, you know, you  
15 call out the inmate and they open their mouth and they  
16 say their name, of course, we would all agree, I hope,  
17 that that person is conscious. But if they just open  
18 their mouth to some of the stimuli -- again, you're  
19 talking about some responses that begin to, on a  
20 spectrum, indicate that the individual is not as deeply  
21 anesthetized as, you know, someone who didn't have  
22 those types of responses.

23 Q. So as we're going through these  
24 different responses, you keep repeating that you would  
25 be looking for other signs as well. How would you

1 train the warden if you were training the warden as to  
2 what to look for?

3 MR. ATYIA: Objection, form.

4 A. I am not going to answer a question  
5 where I'm, you know, training the warden. But I can  
6 answer questions if I was training a medical student,  
7 which is that you would look for, with a verbal  
8 stimulus, you look to see whether they respond in a  
9 sense that, you know, they open their eyes to their  
10 name and they look at you. For a tactile stimulus,  
11 same thing, whether it's sort of the gentle prodding,  
12 do they open their eyes and, you know, look at you and  
13 maybe verbalize? And the same thing with a noxious  
14 stimulus, if they open their eyes with a noxious  
15 stimulus and verbalize or maybe they just open their  
16 eyes, then you start to think that they are on the  
17 spectrum towards consciousness because they are  
18 responding to these stimuli. So those are the types of  
19 things that I would teach a medical student, or a  
20 nursing student, or whatever to look for.

21 Q. Are these easy things to teach a  
22 medical or nursing student?

23 A. Relatively, so, yeah, I think that  
24 they are. I mean, it's pretty straightforward. It's  
25 always a question, you know, well, did they open their

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1 eyes? I thought I saw some eye movement there.  
2 Basically there might be movement that's clear to  
3 everybody. There might be some movement that's, you  
4 know, very, very subtle. And the subtle movement,  
5 again, related to your earlier question about the  
6 finger movement, the subtle movement may not be enough  
7 to really make me think, oh, you know, that's something  
8 that I consider to be a positive response.

9 Q. What about if they made sounds during  
10 the consciousness check, would that indicate  
11 consciousness?

12 A. If they vocalize to, I guess, calling  
13 out their name, that's different than vocal -- and when  
14 I say vocal, I don't mean vocalizing, but in sense that  
15 they are forming complete words and sentences.  
16 Sometimes we use the term vocalization in anesthesia  
17 where they just -- they let out this sort of moan or  
18 they have -- their airway, you know, there's  
19 basically -- you can hear sounds coming from their --  
20 foaming basically is what's occurring. Those again are  
21 signs that the individual is moving from a deeper level  
22 to a more lighter level of sedation, or anesthesia, or  
23 whatever it is they're under.

24 Q. And what about if they kick their  
25 legs during the consciousness check?

1           A.           That would also be, especially if  
2       it's a -- it probably would not be -- I'm not sure I  
3       could consider that to be a purposeful movement for  
4       these different stimuli, except maybe with the sternal  
5       rub, which is going to be the noxious stimulus, or a  
6       trapezius squeeze. And I recognize that these inmates  
7       are strapped down, but you would look for -- you might  
8       see that type of movement and -- again, indicating that  
9       the person is at a lighter level than a deeper level.

10          Q.           What if the inmate said help?

11          A.           Then that person, that inmate would  
12       be conscious.

13          Q.           And if they showed the signs of what  
14       you refer to as moving from one level to another in  
15       terms of consciousness, if they show those signs,  
16       meaning if they blink their eyes or if they kick their  
17       legs, what should be done then?

18          A.           What should be done in the protocol?

19                       MR. ATYIA: Objection to form.

20          Q.           What should be done to further  
21       determine the inmate's consciousness?

22          A.           Well, my understanding of the  
23       protocol is that -- again, I'm not going to answer a  
24       question that tells the State of Tennessee --

25          Q.           I mean, let me rephrase it because

1 I'm not asking in terms of should they give another  
2 bolus dose of midazolam. What I'm asking you is if a  
3 consciousness check is done, let's say the eyelids, the  
4 trapezius squeeze, and the inmate blinks, which you  
5 said is indicative of them possibly becoming conscious,  
6 is it your expert opinion that another consciousness  
7 check should be done? Should they be declared  
8 conscious at that point? What should be done if they  
9 blink?

10 A. I'm going to refer to the protocol  
11 and say, you know -- I believe the protocol says if  
12 they don't pass the consciousness check, they're  
13 supposed to give them more midazolam. I'm not going to  
14 say, you know, what should the warden do at that point  
15 aside from not -- you know, what the warden does  
16 essentially is not really any of my business. I'm not  
17 going to advise a warden or I'm not going to say, here  
18 state, oh, the warden -- you know, they should do this.  
19 I'm not going to try to help a state develop a protocol  
20 to basically, you know, to help them with that kind of  
21 scenario.

22 Q. And I'm not trying to do that. I  
23 guess I was misunderstanding your answer. So are you  
24 saying your answers to if they blink their eyes, if  
25 they open their mouth, if they kick their legs, if they



1 made sounds, all of that would mean or should mean to  
2 the warden that they are conscious?

3 A. I would say that those types of  
4 signs, especially, of course, if they had all of them  
5 together, I suppose, but, you know, there are signs  
6 that indicate that the probability of consciousness is  
7 going to be higher and that, you know, they would have  
8 to do the next step in the protocol, which I believe is  
9 to give them more midazolam.

10 Q. And what do you think would happen if  
11 they received another 500 milligram dose, bolus dose of  
12 midazolam?

13 A. Well --

14 MR. ATYIA: Objection to form.

15 A. The drug levels will be higher. The  
16 midazolam will be higher. And you might at that point  
17 get to the point where they are no longer responsive to  
18 those stimuli. I would expect that to occur with the  
19 500 milligram dose, but there may be some kinetic  
20 reasons why the drug didn't have its -- that effect  
21 when the consciousness check was done.

22 Q. If there were those kinetic reasons,  
23 don't you think it would be helpful to administer  
24 potassium chloride as the second drug rather than  
25 vecuronium bromide so that the warden could continue to

1 monitor the consciousness of the inmate?

2 MR. ATYIA: Objection to form.

3 A. Yeah, I'm -- I understand where  
4 you're going with this in terms, you know, the way they  
5 do this protocol and trying to have a protocol without  
6 vecuronium, but you cannot give -- you give midazolam  
7 and then you give the potassium chloride, you cannot,  
8 you know, give the potassium chloride and then sort of  
9 expect me to be able to figure out, well, you know, and  
10 then do a consciousness check here because by the time  
11 you get around to doing that, the heart is stopped and  
12 the patient -- or the inmate is dead, so it's almost  
13 futile I guess when do you say enough here, but --

14 Q. Well, even if the patient, the  
15 inmate, and you say futile because you believe the  
16 patient will -- the inmate will die within 30 to 60  
17 seconds of receiving the potassium chloride, but if the  
18 inmate is aware at the time that they're receiving the  
19 vecuronium bromide, isn't it also true that they will  
20 then suffer from the time they receive vecuronium  
21 bromide to the time they receive the potassium chloride  
22 as well?

23 MR. ATYIA: Objection, form.

24 A. So let's sort of analyze the  
25 situation in a sort of a time fashion in addition to

1 the actions of these drugs. Basically, you know, let's  
2 assume for the moment that I am wrong and Dr. Van  
3 Norman and others are correct that these inmates are  
4 awake, then, yes, giving vecuronium will -- the inmates  
5 would -- and then followed by the potassium chloride,  
6 the inmates would suffer longer because you now have  
7 this vecuronium on board where they're suffocating or  
8 they're, you know, to use their terms, they're not able  
9 to breathe and then they get the potassium chloride.  
10 Whereas if they just got the potassium chloride, then  
11 you don't have that suffering from the vecuronium. So,  
12 you know, I've said many times if you give vecuronium  
13 to an awake person, if you give potassium chloride at  
14 that dose to an awake person, there's going to be  
15 suffering. So I don't -- I understand where you're  
16 coming from. You're coming from the side that these  
17 people are awake and I'm saying that they're not, and  
18 so if you want to assume that they're awake, then,  
19 yeah, that suffering would happen. But I don't -- I  
20 dispute that assumption.

21 Q. Let's say as the second drug in the  
22 Tennessee protocol instead of vecuronium bromide they  
23 were to give Drano. Do you believe that vecuronium  
24 bromide serves any better purpose in this protocol than  
25 Drano?

1 MR. ATYIA: Objection to form.

2 A. I do not know the purpose for which  
3 vecuronium is being administered in this protocol. I  
4 don't know why they included it. All I can tell you is  
5 that it was used -- I should say I can tell you what  
6 the effects of the drug are. And comparing that to  
7 Drano, Drano is a caustic substance and so it's going  
8 to be similar, I guess, in a sense to the potassium  
9 chloride in the sense that it's going to cause, you  
10 know, severe vein irritation. So in that sense, the --  
11 you know, the Drano situation I guess would inflict  
12 more pain and suffering or more potential pain and  
13 suffering than vecuronium would.

14 MR. KURSMAN: Could we go off the  
15 record for a second?

16 VIDEO OPERATOR: Going off the  
17 record. The time is 5:03.

18 (Brief off the record discussion.)

19 VIDEO OPERATOR: Back on the record.  
20 The time is 5:05.

21 MR. ATYIA: Sorry, I jumped the gun a  
22 couple of times now. I understand from  
23 Mr. Kursman he has let's say 31 or 32 minutes  
24 left. I'm going to ask my questions and then  
25 Mr. Kursman will have whatever remaining time

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1                   he has left, and then if he needs more, he may  
2                   take half of whatever I use over 30 minutes.

3                   That makes sense, but does that work, Alex?

4                   MR. KURSMAN: And I agree to that.

5                   MR. ATYIA: Thank you.

6                   EXAMINATION BY MR. ATYIA:

7                   Q.           Dr. Antognini, is that okay with you  
8                   if we keep you a little longer than seven hours?

9                   A.           That's fine.

10                  Q.           Okay. I'll try to be very, very  
11                  fast. My first question is, you've got shown this  
12                  autopsy report -- I'm sorry, let me rephrase. You got  
13                  shown toxicology reports of executed inmates that  
14                  showed blood concentration of midazolam, do you recall  
15                  that?

16                  A.           Yes, I do, yes.

17                  Q.           Okay. Do you have any idea of how  
18                  long after the inmate died the blood was harvested for  
19                  that testing?

20                  A.           I don't have a specific number for  
21                  those autopsies, but in general, I think they're done  
22                  the next day, but it can vary. I think that can  
23                  be done -- it depends on when the execution occurred  
24                  and when the body gets to the morgue and all that, so I  
25                  think it's sometimes as much as 24 hours, but I --

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1 Q. I'm sorry.

2 A. So those ones I didn't see what the  
3 time interval was.

4 Q. Okay. And do you have any idea how  
5 long after the blood was harvested that it was tested  
6 for midazolam concentration?

7 A. I do not, no.

8 Q. And do you -- I wasn't clear on this.  
9 Do you have any opinion about the effect that time  
10 could have on the midazolam concentration with regard  
11 to blood taken out of an executed person's body?

12 A. In general, drugs, drug  
13 concentrations postmortem can vary and change over  
14 time, and I don't know how much data is out there for  
15 midazolam, but most drugs do that. So I think you  
16 would have to, again, take these with a grain of salt.  
17 Now, I think Mr. Kursman mentioned a study where that  
18 was looked at and I don't -- I'm not familiar with that  
19 study and I'm not sure, maybe he was -- you know, what  
20 that study is. In any case, it's pretty well  
21 documented that drug concentrations postmortem can vary  
22 and may not be reliable. But specifically midazolam, I  
23 don't know.

24 Q. Okay. And you got asked a lot --  
25 Mr. Kursman asked you a lot -- there's been a lot of

1 discussion about the nanograms -- is nanograms per  
2 milliliter concentration of midazolam?

3 A. Yes.

4 Q. Okay. And you talked about a study  
5 that mentioned 1,541 being a data point of nanograms  
6 per milliliter in one of those studies?

7 A. Yes. That was the -- Antonik, I  
8 believe, was the study on that one, yes.

9 Q. Okay. Do you have any idea,  
10 knowledge, or estimate of what the concentration of  
11 midazolam would be in an individual who receives an  
12 injection of 500 milligrams of midazolam according to  
13 the protocol?

14 A. I do not have -- you can certainly  
15 extrapolate from the data that we have on midazolam.  
16 You know, if you give 5 milligrams of midazolam and you  
17 get a certain peak level. If you gave 500, which is  
18 100 times more, you would expect the peak level to be  
19 about 100 times more. Those type of pharmacokinetic  
20 extrapolations are pretty solid. I don't want to say a  
21 hundred percent, but they, for the most part, you can  
22 just do that type of extrapolation. So I'm not sure I  
23 answered your question about it.

24 Q. I think I understand that you can --  
25 there may be a way to calculate. What I know is like

1 do you have like a ball park figure for me? Are you  
2 able to do this calculation giving me some kind of ball  
3 park figure of what you would expect the concentration  
4 of midazolam in someone's blood who's been given  
5 500 milligrams of midazolam according to the protocol?

6 A. Off the top of my head, you're asking  
7 if I have that off the top of my head. The only number  
8 that I have off the top of my head is the 1,554 that  
9 we've been discussing, and that's after a -- that was  
10 about a 5 milligram dose in a 70 kilogram adult, so I  
11 could use that number and extrapolate and that would be  
12 basically 100 times 1,554, which would be -- let me do  
13 my math here. It would be 155,000 approximately, is  
14 what I would guess, nanograms per mill. So 1,554 for 5  
15 would be 100 times that. That would be about 150,000  
16 or so.

17 That just seems like a very -- you  
18 know, and kudos to Mr. Kursman and his expert  
19 witnesses. That's something that I didn't see there.  
20 It just seems like a very high number and maybe -- you  
21 know, it may be true. But I'm certainly going to go  
22 back and take a look at that and then look at other  
23 studies that gave a bolus of midazolam. I guess, that  
24 number seems very, very high and I -- I'm going to look  
25 at, you know, some studies like Greenblat did looking



1 at -- and others looking at midazolam boluses. I just  
2 don't think they achieved those high of levels, so  
3 that's why that number is really surprising to me.

4 Q. Okay. Well, let's -- I appreciate  
5 you explaining that. I want to slow it down for a  
6 second. Let's just assume that the study Mr. Kursman,  
7 the number Mr. Kursman pointed us to is correct, the  
8 1,554, I think you said, right?

9 A. Okay.

10 Q. You're saying that based on the  
11 assumption that that is a correct number, 1,554 is a  
12 correct number in that study, you would expect a person  
13 injected with 500 milligrams as per the protocol to  
14 have a concentration of 150,000?

15 A. Okay. I'm sorry, I think I've -- I  
16 haven't misspoken, I just haven't been thinking this  
17 through about what -- on comparison here. So, remember  
18 that the -- so, again, we have to take with a grain of  
19 salt these postmortem samples. But let's assume for  
20 the moment you're able to get a blood sample right  
21 immediately before death. You know, you've got an  
22 inmate in there and you then, you know, go through that  
23 protocol. And let's assume for the moment that a  
24 typical execution takes 12 minutes or so, or maybe 13  
25 minutes or so. So the way these drugs work, I guess,

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1       when you get this injection and you get this peak level  
2       and then it starts to fall down very rapidly. So the  
3       14, or 13, or 12 minute point at which death occurs,  
4       that is much lower than the peak effect or the peak  
5       level, because that occurs at around one minute or so.  
6       So you can't -- you know, if you're looking at what you  
7       see postmortem, you know, what drug was actually  
8       present at the time of death is going to be lower than  
9       what you would see at the peak because of that  
10      (inaudible) and all the things that caused the drug  
11      levels to go down. So when I said that a 500 dose of  
12      midazolam based on the study that we were just talking  
13      about would produce -- again, let me do the mental math  
14      here. It's 1,500 approximately times 100, that would  
15      be 150,000. That would be the peak level. But  
16      again -- so I know you want an answer. I guess I'm  
17      very suspicious on that number. It just seems very,  
18      very high.

19               Q.           Okay.

20               A.           Yeah. Anyway. And so I hope I've  
21      answered your question. I know I've taken some time on  
22      that doing that, but --

23               Q.           So let's say you have a peak level  
24      that's going to drop off quickly, that's what you're  
25      saying?

1 A. Yes.

2 Q. Would the effect that you've  
3 expressed, which I believe is that midazolam would  
4 render the person unconscious, would that effect also  
5 drop off quickly?

6 A. No, because the -- if you do a -- no.  
7 The answer is no because the drug level is so high, you  
8 know, even when it's falling off rapidly, it's still  
9 well above the amount that produces unconsciousness or  
10 produces the effects that you're looking for. So,  
11 again, a much larger dose is going to last a lot  
12 longer. You're going to be above that threshold a much  
13 longer period of time.

14 Q. Okay. I want to switch gears for a  
15 second. There's been a lot of -- some talk about the  
16 other engagements or depositions or capacities in which  
17 you've served as an expert witness. You remember that?

18 A. Yes.

19 Q. And you've disclosed that you're an  
20 expert witness in Oklahoma litigation?

21 A. That is correct, yes.

22 Q. Have you ever seen an execution in  
23 your capacity as an expert witness?

24 A. Yes.

25 Q. Why didn't you disclose that in your

1 report?

2 A. Because I observed the execution  
3 yesterday.

4 Q. Can you tell us what you observed in  
5 that execution?

6 A. So I observed the execution of Donald  
7 Grant in McAllister, Oklahoma, yesterday. And I  
8 don't -- I was asked to do that by -- you know, we can  
9 talk about the details why. But they needed to have  
10 somebody observe that. And that was the first and only  
11 one that I've observed. And the protocol basically  
12 they follow a three-drug protocol. They give midazolam  
13 followed vecuronium followed by potassium chloride.

14 And I was in the observation room  
15 about 15 feet away. There were a lot of people in that  
16 room, about 18 of us. But I had a very good view of  
17 the inmate. And after the warrant was read and the  
18 inmate had his statement, they had to cut off the mic  
19 at the two minute point because the inmate continued to  
20 talk, and over the course of the next several minutes,  
21 it seemed like, it's kind of hard after I -- you know,  
22 over that period of time that the inmate became more --  
23 appeared to become more sedate, subdued, and then  
24 closed his eyes. And then I would guess about four or  
25 five minutes after, or maybe three minutes or four

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1 minutes after the inmate seemed to be getting more  
2 sedate and sleepy, somebody came in to do what appeared  
3 to be consciousness checks where they did a sternal  
4 rub. I could hear them call out the inmate's name.  
5 They were pinching the inmate's arm.

6 Between the time that the inmate  
7 became more sedate and the consciousness check, the  
8 inmate's breathing was a little bit shallow and it  
9 looked like he had sort what we describe as this  
10 rocking boat motion where the abdomen would go up and  
11 the chest and the neck muscles would sort of go down.  
12 It was difficult for me to know whether that was a  
13 complete airway obstruction or a partial airway  
14 obstruction at that point. But between the time of  
15 when the drug went in and when the consciousness check  
16 occurred, I did not see any spontaneous movement. I  
17 did not see any signs of distress, or pain, or anything  
18 of that nature. Primarily I would be looking for  
19 movement; I did not see that.

20 After the -- during the consciousness  
21 check, I did not see any response to that. The inmate  
22 did not open his eyes. I did not see his mouth move.  
23 I did not see him moving any of his extremities or at  
24 least that I could see. And then after the  
25 consciousness checks were done, the Department of

1 Corrections individual, and I don't know whether that  
2 was the warden, who that was, turned the mic on to say  
3 that the inmate is unconscious. And during that period  
4 of time, I could hear pretty loud snoring, the  
5 patient's breathing -- or the inmate's breathing  
6 pattern, which I couldn't really know whether it was  
7 partial or complete airway obstruction, at least at  
8 that point in time, seemed to be a partial airway  
9 obstruction because it was pretty loud snoring. And  
10 then the mic went off.

11 And then the -- presumably the other  
12 drugs started to go in, the vecuronium. I did see some  
13 bubbles flowing through the IV that I didn't see  
14 earlier, so I don't know which arm the IV went -- or  
15 the drugs went. I should say I don't know which  
16 drug -- I'm sorry, which arm the midazolam went in,  
17 because they have two IV's. But in any case, I could  
18 see some bubbles flowing through the IV's. And then  
19 soon thereafter, breathing ceased. It looked like the  
20 inmate's lips started to turn a little bit bluish. And  
21 then there was a wait period of several minutes, it  
22 seemed like. And then the person came in, which I  
23 presume was a physician. I don't know who does the  
24 declaration of death and all that, but they came in,  
25 they listened to the inmate's chest with a stethoscope,

1       they felt for a pulse in the neck, presumably the  
2       carotid pulse, that's what it looked like. And then  
3       they were looking at the pupils as well. And then that  
4       person walked out and the -- someone came out -- came  
5       into the execution chamber and said that the time of  
6       death was, I think, 10:16, and then the curtains went  
7       down, and that was it. And we were escorted out of the  
8       room. So that's essentially what I saw. You know, I  
9       haven't -- you know, that's from my recollection of  
10      what I saw, so -- as I sit here today.

11               Q.           I want to talk for a second about the  
12      airway obstruction. Have you ever heard patients in a  
13      clinical setting, like in the operating room who are  
14      under anesthesia snore?

15               A.           Yes. It happens fairly -- it can  
16      happen pretty regularly if you're not careful about  
17      maintaining their airway properly, yes.

18               Q.           So why does that happen?

19               A.           Well, the -- I shouldn't say all, but  
20      most of the anesthetic drugs will cause basically a  
21      relaxation of the muscles of the neck and that results  
22      in an airway obstruction. You know, it can be partial  
23      where you're still able to get air in and out and that  
24      causes the snoring sound because you get this sort of  
25      intermittent -- and I know you can't -- I'm basically

1        what I'm doing is I'm sort of clapping my hands a  
2        little bit like that, and you can see that intermittent  
3        rapid opening and closing of the airway would cause the  
4        snoring to occur. And that's basically happening in  
5        the back of the throat where the airway is starting to  
6        close down and so you get this intermittent opening and  
7        closing of the airway and that causes the snoring,  
8        usually with the tongue falling back in the throat.

9                Q.                Does anything about that in a  
10       clinical or in an execution setting lead you to believe  
11       that it's some expression of an experience of pain?

12              A.              No, it's -- snoring can happen in  
13       anesthetized individuals. It does not indicate  
14       anything related, in my opinion, related to  
15       consciousness. It's just the effect of the drug on the  
16       airway.

17              Q.              Is there anything about what you saw  
18       in Oklahoma that changes your opinion or otherwise that  
19       you need to tell us?

20              A.              No. Everything that I saw  
21       essentially -- you know, having read some descriptions  
22       and having -- you know, knowing how these drugs work,  
23       when I saw that, I thought, this is what I would expect  
24       to see. This is what I would expect to happen with  
25       these -- with this. So nothing really happened that



1 made me -- you know, changes my opinion about, you  
2 know, the effects of these drugs.

3 MR. ATYIA: Alex, I don't have  
4 anything that I can think of right now.

5 MR. KURSMAN: Just so I can put on  
6 the record, we are going to object to all of  
7 that testimony. It's outside the scope of his  
8 expert report. I'm also going to ask at the  
9 end of this deposition to keep this deposition  
10 open as this is the first time we've been  
11 provided with any information that your expert,  
12 Dr. Antognini, witnessed an execution. And to  
13 the extent he's basing any of his opinions,  
14 including those that you just questioned on,  
15 him on about that execution, we are objecting  
16 to that as well. With those objections in  
17 mind, I will begin my final 40 minutes or so.

18 EXAMINATION BY MR. KURSMAN:

19 Q. Let me ask you about that execution  
20 yesterday that you just testified to. Did you take any  
21 notes from the execution?

22 A. Yes, I did.

23 Q. And we will request all of those  
24 notes. Did you talk to anybody about --

25 MR. ATYIA: Hold on. Hold on. You

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1 don't request -- this is not the place to be --

2 MR. KURSMAN: Well, I'm requesting  
3 those notes on the record.

4 MR. ATYIA: Through Zoom.

5 Q. Do you have those notes, Dr.  
6 Antognini?

7 A. I have them here in my room. I don't  
8 have them in front of me.

9 MR. KURSMAN: Okay. So we are  
10 requesting them from Dr. Antognini.

11 MR. ATYIA: I'm going to go on  
12 record, Dr. Antognini hasn't been -- we'll  
13 confer about it. We'll confer about it.

14 MR. KURSMAN: Are you objecting to  
15 providing us with Dr. Antognini's notes about  
16 an execution he witnessed yesterday and you  
17 just gave us notice of that execution at the  
18 six hour and 20 minute mark of this deposition  
19 that is supposed to last seven hours?

20 MR. ATYIA: Well, Alex (inaudible),  
21 we just found out about it. I asked him about  
22 it. You're free to ask him about it. We're  
23 happy to -- I'm answering your question. I'm  
24 happy to -- we are happy to confer to give you  
25 everything that you are entitled to. I'm just

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1 saying you haven't served a subpoena. You're  
2 stating it, a formal request in a deposition  
3 and I'm just saying, you know, we'll work with  
4 you, but that's not --

5 MR. KURSMAN: For the record, Mr.  
6 Atyia, when did you find out that Dr. Antognini  
7 was going to witness this execution?

8 MR. ATYIA: Alex, I'm not under oath.  
9 I'm not a witness in this case. If you want  
10 to --

11 MR. KURSMAN: For the record, when  
12 you found out that Dr. Antognini was going to  
13 witness this execution.

14 MR. ATYIA: I'll tell you this: I'm  
15 not under oath and I would have to look back at  
16 when we found out in preparing for this  
17 deposition. I can't give you an exact time.  
18 Hold on. I'm answering your question. And I  
19 would like if you would -- I'm going out of my  
20 way to give you the information you just  
21 requested. I'm not trying to keep anything  
22 from you. We are happy to provide you whatever  
23 you're entitled to. I'm happy to go through  
24 and tell you exactly when I found out, but it  
25 was very recently. This is not something I was

1           aware of and have known for a long time and it  
2           just happened yesterday.

3                   MR. KURSMAN:   Okay.   And -- go ahead.  
4           go ahead.

5                   MR. ATYIA:   If you want to confer,  
6           we're not going to try to keep anything from  
7           you, Alex.

8                   MR. KURSMAN:   I would like for you to  
9           say on the record when you did find out that  
10          Dr. Antognini was going to attend this  
11          execution.

12                   MR. ATYIA:   I don't remember.   I have  
13          to look at my -- I really don't remember.   And  
14          I'm not under oath and I don't have to -- I'm  
15          not trying to be difficult.   Honestly, this  
16          doesn't count against your time.   You're free  
17          to ask, I just don't have that information  
18          right now offhand and I'm -- you know, we're  
19          happy to give it to you.   I'll look back  
20          through things.   We can figure it out.

21                   MR. KURSMAN:   Okay.   So we are  
22          requesting the notes that Dr. Antognini took  
23          both during the execution and in anticipation  
24          of the execution.   Those would be responsive to  
25          our RFP's including 8617.

1 Q. Dr. Antognini, aside from the notes  
2 that you said you have in your possession at your  
3 house, did you talk to anyone about the execution?

4 A. So just as -- with my work with the  
5 attorneys in Oklahoma, so I did speak to the attorneys  
6 in Oklahoma immediately after the execution. And then  
7 I spoke with Mr. Atyia after that, and that was  
8 yesterday.

9 Q. And what did you tell them about the  
10 execution?

11 A. Basically what I just said here about  
12 the -- you know, what I saw, you know, the events that  
13 I saw. I mean, there are some details that I -- that  
14 I -- and other things that I saw that are not --  
15 they're not high level details, they're just other  
16 things that I saw occurring.

17 Q. And what were those?

18 A. So I made a lot of notes about how  
19 many people were in the room, where I sat relative to  
20 these people. I made notes about the individuals that  
21 were in the execution chamber itself, where they stood.  
22 I made a small diagram of the -- well, I shouldn't say  
23 of the room, but the execution chamber and the -- has a  
24 computer monitor off to the right of the viewing  
25 window, so I made a note there because that viewing --

1       that computer screen gets the feed of a camera that's  
2       looking directly down on the inmate so you can see the  
3       inmate's face and chest and neck and arms, maybe not  
4       all of their arms, but you can see most of their arms.  
5       I made a lot of notes about -- I should say I kept a  
6       time, sort of a time stamp so when certain events  
7       occurred, I put the timing on when they occurred,  
8       because there's a clock in the chamber that allows you  
9       to obviously read the time and you can write that down.

10               As far as the execution is concerned,  
11       there was one point at which the inmate -- this is  
12       after the presumably the injection of midazolam. There  
13       was one point at which the inmate had a -- made sort of  
14       larger breath than he had before, so it was like sort  
15       of a gasp in a way. That, I think, occurred just the  
16       one time. Let's see here. Okay. Then the -- what  
17       else was occurring as far as the inmate is concerned?  
18       So I did not observe any tears, although I did look at  
19       a couple of news reports afterwards and some of the --  
20       one reporter thought they saw the appearance of tears  
21       and another reporter said that there were tears  
22       streaming down his face. I did not see that, and I was  
23       looking at the inmate's face, so I don't know, could I  
24       have missed it? That's possible, but -- that, I did  
25       not see that.

1                   Okay. What else? That, I think I --  
2           again, that's -- I'm thinking about other things that I  
3           could have observed that -- I think at this point, I've  
4           exhausted all of my -- there was a -- at the very end,  
5           this is after the inmate -- I'm not sure that -- I'm  
6           not sure when this occurred. I would have to refer  
7           to -- I'm not sure when it occurred relative to the  
8           declaration of death, but it was very, very close to  
9           that -- around that time, probably within even seconds  
10          that there was a momentary time, and talking about just  
11          a few seconds where there was some blood coming out of  
12          the IV in the left arm and then it went back in. And  
13          let's see.

14                   I'm sure I might have missed a few  
15          things here and there. I mean, some of -- a lot of my  
16          notes, I shouldn't say a lot, but I would write, you  
17          know, the inmate's still breathing, still breathing,  
18          things like that where I was sort of just writing down,  
19          you know, he was still breathing or doing something  
20          like that. Okay. Again, I think that's -- I think  
21          I've gotten everything -- well, I can't recall anything  
22          else.

23                   Q.           You said when the execution was over,  
24          you talked to the Oklahoma Attorney Generals. What did  
25          you tell them about the execution?

1           A.           Well, I believe that's privileged  
2 information. I don't know. You know, I know Oklahoma  
3 is not being represented here, but that seems to be  
4 attorney-client privilege there. I mean, that was  
5 something I was talking to them about that, so --

6           Q.           You're serving as an expert witness  
7 in that case?

8           A.           Not in -- well, let's see. Did I  
9 serve as an expert witness in that particular case of  
10 Mr. Donald Grant? My guess is the answer is, yes, I'm  
11 pretty sure the depositions that I have given or the  
12 testimony that I've given I believe included him.

13          Q.           And are you set to testify at a trial  
14 in that case?

15          A.           Yes. And I mean, I have -- I have  
16 given -- there was testimony in January that I guess  
17 would not be reflected in your -- my report because my  
18 report was given in December. I'm not sure, you know,  
19 when it was scheduled and all that, but it came up  
20 rather quickly, so I did give testimony in January for  
21 Oklahoma.

22          Q.           When were you asked to view the  
23 execution?

24          A.           I would say maybe two weeks ago.

25          Q.           And who asked you to view the



1 execution?

2 A. The Attorney General's Office.

3 Q. Were you paid?

4 A. I will charge for it. I haven't been  
5 paid yet, of course, but I will, you know, charge for  
6 it, yes.

7 Q. How much will you charge for viewing  
8 the execution?

9 A. I don't know exactly. The only  
10 reason is because it's not part of the contract,  
11 basically, so I think what we'll be doing is  
12 essentially charging what I would normally charge for,  
13 you know, going to a trial kind of thing, showing up in  
14 person, whatever that is, and it might be \$4,000.00. I  
15 forget exactly what the contract -- I think it's in the  
16 report.

17 Q. Is it \$6,000.00, does that sound --

18 A. I don't know. It might be. I don't  
19 remember what my contract says about how much I would  
20 be paid for, you know, showing up in person for  
21 something. But it wasn't part of the contract and I  
22 said -- we decided we could work those details out  
23 later, so --

24 Q. And when did you first inform the  
25 attorneys at the Tennessee Attorney General's Office

1       that you were going to view the execution?

2                   MR. ATYIA:   Okay.   That's plainly  
3       privileged.   I'm happy to waive it -- if  
4       Dr. Antognini can answer it, I'm happy to  
5       selectively waive that to allay your concerns,  
6       Alex.   But if you'll recognize that's  
7       privileged and (inaudible) waiver, I'll let him  
8       answer.   I'll let him answer.   If you agree on  
9       the record that we're just selectively waiving  
10      it so you can explore that nobody tried to  
11      surprise you, of course he can answer it.   But  
12      I need an agreement to a selective waiver of  
13      privilege.

14                  MR. KURSMAN:   When you spoke is not  
15      privileged, so --

16                  MR. ATYIA:   You're asking about what  
17      we spoke about.

18                  MR. KURSMAN:   No, no, I'm not asking.  
19      I'm asking when he told you.   You already  
20      established on the record that he did tell you.  
21      I'm asking when.   That's not a privileged  
22      question.

23                  MR. ATYIA:   Fair enough.   I'm going  
24      to object to the privilege, but Dr. Antognini,  
25      you can answer.

1                   A.           I don't remember exactly. So I'm  
2           trying to in my mind piece together the time line here  
3           and when was I asked to do this. So now that I think  
4           about it, it might have been more than two weeks ago.  
5           So here's the reason why there's -- you know, my  
6           mind -- I'm a little bit, you know, not sure. Because  
7           initially -- so I still -- I do clinical work. It's  
8           not in anesthesiology, it's in wound care, and I see  
9           patients on Tuesdays and Thursdays, and this execution  
10          was scheduled on a Thursday. And when I was asked  
11          about this, I said, well, you know, let me look at my  
12          schedule. I don't think that's going to work out  
13          because I have -- even if, you know, I shifted things  
14          up, it turned out that that -- this last Wednesday, the  
15          26th, was going to be -- there was a personal thing  
16          that I was going to be going to at night, and I said,  
17          you know, it's just -- I would have to travel at night  
18          to get there. I just -- you know, I'm not really  
19          willing to do that and I'm not sure I want to see an  
20          execution anyway. So these are my discussions with the  
21          State of Oklahoma. And then at some point -- so I  
22          don't know when I mentioned this to Tennessee.

23                   Q.           Was it over a week ago that you  
24          mentioned it to Tennessee?

25                   A.           Yeah, I would say it was over a week

1       ago.

2                   Q.           Was it over two weeks ago?

3                   A.           I'm not sure about that. But the  
4       reason why I wasn't sure, I may not have told them, is  
5       that I wasn't sure I was going to be doing this. And  
6       then this event that I was going to go to on Wednesday  
7       here in Los Angeles was postponed because of COVID  
8       reasons and I thought, well, now I can move my patients  
9       around and I can do this. So at about two weeks ago,  
10      I'm guessing, is when I decided I would do this. And I  
11      don't remember exactly when I mentioned it to the  
12      people -- you know, to Mr. Atyia and so forth. I just  
13      don't recall. It was after that point. And was it  
14      more than a week ago? It might have been. I just  
15      don't know when it was exactly.

16                  Q.           Okay. But it was -- you think it was  
17      over a week ago?

18                  A.           I think so, yeah. I'm not sure. I  
19      just don't know.

20                  Q.           Okay. When you got home, did you  
21      talk to your wife about it?

22                  A.           Not about the execution itself. I  
23      talked to her about the -- you know, travel and things  
24      like that. And you know, I have to admit my wife is  
25      asking about it and I said I cannot talk to you about

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1       it because I haven't done my affidavit yet. I have to  
2       do that and I don't want there to be any influence  
3       about anything, so I did not talk to her about it,  
4       about the specific events between when we -- you know,  
5       the curtain goes up and when the curtain goes down.

6               Q.           So what did you talk to your wife  
7       about concerning the execution?

8               A.           Well, again, it depends on what you  
9       mean by the execution. I talked -- I said to her, you  
10      know, there are people in the witness room and that we  
11      were all close together and some people had masks on  
12      and others didn't, because obviously I was concerned  
13      about COVID, and then about where I had to wait and so  
14      forth, but nothing about the execution itself.

15              Q.           At what point did you read news  
16      reports about the execution?

17              A.           Probably maybe an hour or so after  
18      the -- well, maybe not. I'm not sure when, but it was  
19      pretty soon after I had seen the execution.

20              Q.           Why, why did you read news reports?

21              A.           Well, I was just curious to see what  
22      the description was versus my experience. Now, should  
23      I have done that? Maybe not, but I did it, so I'm  
24      being truthful about that.

25              Q.           And did the experience -- have you

1       felt any trauma from that experience?

2                       MR. ATYIA:   Go ahead.

3               A.           Not really.   Not yet.   I mean, I know  
4       that -- you know, it's going to be -- you know, one  
5       thing I didn't mention to you, but I will now is,  
6       because I'm a religious person, I said prayers before  
7       the execution for the victims and for the people that  
8       were actually involved, you know, having to carry out  
9       the execution, and for the inmate.

10              Q.           Are you going to seek any  
11       psychological or psychiatric treatment for your  
12       experience viewing the execution?

13                       MR. ATYIA:   Objection.   I can't  
14       instruct him not to answer.   I don't -- I think  
15       that's going into his private information.  
16       That's really not fair.   But I can't instruct  
17       him not to answer.   Dr. Antognini, go ahead.

18              A.           I don't -- at this point, I don't --  
19       you know, when you're sane, you don't think you need a  
20       psychiatrist, and then when you finally do go insane,  
21       you have problems, then -- at this point, I don't see  
22       that happening.   Now, could it?   I suppose that's true.

23                       But I want you to know, and I'm going  
24       to be very up front about this is that, you know, I  
25       didn't seek out this -- you know, to see this

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1 execution. In fact, I was pretty resistant to doing  
2 it. But there's always been, you know, this nagging  
3 thing in my head about here I have been doing this work  
4 for six years and, you know, maybe I really should see  
5 one of these and more than one of these to say, you  
6 know, what exactly is happening here. Am I, you know,  
7 doing the right thing here? Am I -- is this actually  
8 my opinion basically or my expert opinion, does that  
9 comport with, you know, what is actually occurring?  
10 And so I did it for that reason as well, and so --

11 Nobody likes to see that happening.  
12 We all wish we could have turned the clock back and I'm  
13 sure probably the inmate as well. But, I guess, you  
14 know, one of the strongest reasons I did this was  
15 because I felt, you know, if -- Antognini, if you're  
16 going to start -- if you're going to continue to do  
17 this type of work where you say it's okay basically  
18 that this is what you expect to happen and that  
19 testimony and expert opinion, you know, leads to this  
20 event, maybe you should see with your own eyes, you  
21 know, what exactly is happening here. So that also was  
22 a reason for me to do this.

23 Q. So part of the reason you witnessed  
24 the execution was for self-discovery, is that what  
25 you're saying?

1           A.           I wouldn't say self-discovery. It  
2 was more about basically -- so in prior -- in prior  
3 executions that I have heard about, you know, from  
4 witness reports and so forth, you know, people talk  
5 about heaving and gasping and, you know, things like  
6 that, and I am of the belief -- again, I've only seen  
7 the one yesterday, but I am of the belief that I think,  
8 you know, reporters in general use pejorative terms for  
9 this and for what they might observe.

10                   And also because there's -- there is  
11 this, I think, false understanding among lay people  
12 about what happened stepping outside the execution  
13 setting and into the clinical setting. There is this  
14 sort of misunderstanding about what happens in an  
15 operating room in terms of things and, you know, I  
16 think people expect -- a lay person expects you  
17 anesthetize somebody, they lie there still, calm, you  
18 know, nothing's happening, you know, they just -- and  
19 the surgery continues. Whereas in an operating room, a  
20 lot of bad things happen, patients move, you know,  
21 complications occur. It's not as pretty as we would  
22 like to think it is. So when I see these reports of  
23 whatever occurred in executions, in my mind's eye, I  
24 think to myself, well, you know, this is probably what  
25 happened, you know, this is -- you know, that's -- you



1 know, as an example, what happened in the John Grant  
2 execution where there was, you know, vomiting. And I  
3 thought, well, that's just regurgitation. He had eaten  
4 a lot of food and drink. And in the operating room, if  
5 I had a patient there on the table and they had eaten  
6 that much and drank that much fluid and then you gave  
7 them, you know, a big dose of an induction drug, or in  
8 this case, 500 milligrams of midazolam, regurgitation,  
9 if it happened, I'm not surprised by that.

10 So people thought, oh, my God, that  
11 was horrific. That was, you know, terrible what  
12 happened. Well, that's what you would expect to happen  
13 in that setting. It's an unfortunate common -- I  
14 shouldn't say common, but it occurs clinically.  
15 Regurgitation and vomiting can happen in the operating  
16 room on a patient, so -- to circle back to your  
17 question about, you know, this self-discovery kind of  
18 thing, I guess, more about trying to educate myself, I  
19 suppose, or see exactly what's going on as opposed to  
20 self-discovery.

21 Q. In the operating room, do you see  
22 the -- what you described as rocking the boat, do you  
23 see that all the time when a patient is under general  
24 anesthesia?

25 A. It's called rocking boat, not rocking

1 the boat, but a rocking boat. You know, it's a minor  
2 issue. But I wouldn't say you see it all the time  
3 because the -- hopefully you are controlling the airway  
4 to the extent that you don't see that. So it happens  
5 frequently enough that we learn about it and we have to  
6 observe the patient for it where we're trying to  
7 maintain the airway.

8 Q. And what do you do when you see  
9 rocking boat?

10 A. So a classic, you know, rocking boat  
11 motion where the abdomen basically is going up, the  
12 chest and neck muscles and so forth are going down  
13 indicating a complete airway obstruction. You have to  
14 basically relieve that. So usually that's going to  
15 be -- so these are on patients that are not intubated  
16 and you have to do a jaw thrust to open up the airway.  
17 You might have to assist their breathing with a mask.  
18 You might have to put an oral airway in there or some  
19 other type of airway.

20 Q. Is rocking the boat also known as  
21 paradoxical breathing?

22 A. I think that -- I'm not that familiar  
23 with that term. I've seen that in relation to rocking  
24 boat, but, yeah, I think that's about right.

25 Q. And in a hospital setting when you

1 see rocking boat, do the doctors in the room do  
2 something to then ameliorate that problem?

3 A. Yes. I mean, as I said, we would do  
4 an air lift -- or we would do an airway -- a jaw thrust  
5 or put an airway in because the patient can die if you  
6 don't relieve that.

7 Q. And rocking boat, as you call it,  
8 that you said indicates airway obstruction?

9 A. Yes.

10 Q. Does it indicate anything else?

11 A. Not really. I mean, it's airway  
12 obstruction caused by or as the result of the drug that  
13 was administered, usually an anesthetic drug.

14 Q. And why would an anesthetic drug  
15 cause rocking boat?

16 A. Because the anesthetic drug collapses  
17 the airway or relaxes the airway muscles so that the  
18 individual cannot maintain their airway. The tongue  
19 falls back, and at that point, you now have -- if  
20 you've completely occluded the airway, the patient  
21 could still be trying to breathe, but they can't  
22 breathe through that closed airway.

23 Q. And if you are awake or aware while  
24 rocking boat is happening, is that a painful sensation  
25 for an individual?

1           A.           That sensation -- you would not -- an  
2       awake person can clear their own airway like that.  
3       They don't -- an awake person doesn't demonstrate this  
4       rocking boat phenomenon because they are able to open  
5       up their own airway. So if you think about it, you  
6       know, you wouldn't lie there awake with your tongue  
7       falling back on the back of your throat and not clear  
8       it yourself. You would open up your airway yourself,  
9       so it doesn't really happen in somebody who is awake.  
10      Now, of course, we're all familiar with people who  
11      snore, but that occurs when they're going through the  
12      stages of sleep and, you know, sleep is sort of similar  
13      in that regard that you get the airway relaxation and  
14      the closure of the airway.

15           Q.           If you saw heaving or gasping during  
16      the execution, would that change your opinion at all?

17           A.           No. Gasping is -- in fact, as I just  
18      mentioned -- or I just mentioned, there was one -- so  
19      gasp is defined basically as a sudden intake of air,  
20      more or less. It has a connotation that occurs with  
21      sort of like a panic thing like you see something that  
22      scares you, you go, oh, you make that sudden intake of  
23      air. And what I observed was, I think, a momentary  
24      opening of the airway where the inmate was able to take  
25      in a much fuller breath than he had been able to do so

1 before. So, now, heaving as in, you know, somebody who  
2 is vomiting is -- again something that happens with the  
3 administration of anesthetic drugs, amnestic drugs, and  
4 so forth, so even with heaving, I -- you know, that  
5 would not change my opinion unless -- you know,  
6 again --

7 Q. What if you saw tears, would that  
8 change your opinion?

9 A. No. No, because the problem with the  
10 tears is that, you know, we do, as I said -- testified  
11 earlier, tears are one of the components of basically  
12 -- or one of the things that we might look for.

13 But you also have to think about  
14 what's going through the inmate's mind, right, after  
15 the warrant has been read and the inmate has basically  
16 given their last statement. And sometimes these  
17 inmates are contrite and are, you know, sorry for what  
18 they've done. Other times they're combative, I  
19 suppose. I've only -- you know, I've only seen this  
20 once, so I can only rely on the descriptions. But, you  
21 know, they're facing their moments in life and I think  
22 some of them probably get tears from it, tears forming  
23 as the drugs are going in. So you can see those tears  
24 coming down as the midazolam is going in. I mean,  
25 theoretically you could. I think that's quite

1 possible. So seeing those tears forming, especially  
2 right at the period when the midazolam is going in  
3 doesn't really change my opinion.

4 You know, I don't think -- the only  
5 noxious -- in my opinion, the only noxious thing that  
6 occurs in these inmates is the administration of  
7 potassium chloride. I certainly disagree and dispute  
8 the contention by the other experts that, you know,  
9 vecuronium is a -- you know, is a noxious stimulus. In  
10 an awake person, yes, but not in somebody who is  
11 anesthetized and I've given, I think, my opinion on  
12 that.

13 Q. Well, just so I'm clear, so are you  
14 saying potassium chloride is a noxious stimuli in a  
15 person who receives 500 milligrams of midazolam?

16 A. Yes. But let's make sure we're using  
17 the same terminology. I differentiate noxious stimuli  
18 or noxious stimulus from pain. Unfortunately, people,  
19 including doctors, you know, they conflate the two.  
20 They say painful stimulus or a noxious stimulus. A  
21 noxious stimulus is one that basically -- and I think  
22 I, my opinion, in my report, that it basically is  
23 capable of producing tissue damage. The experience of  
24 pain is basically what the individual sort of feels and  
25 the experience that they have, so you can apply a

1       noxious stimulus to a brain dead human, but I don't  
2       think that that human, of course, has pain because  
3       they're brain dead, so --

4               Q.           Is there anything that you could have  
5       seen yesterday during the execution that would have  
6       changed your expert opinion?

7               A.           Is there anything I could have seen  
8       or I did see?

9               Q.           No, that you could have seen.

10              A.           Well, if the consciousness checks  
11       were done and the, you know, prisoner responded  
12       vigorously to that and then they proceeded, then I  
13       would say, hmm, that's not, you know, the way it's  
14       supposed to be in the protocol. If the inmate --  
15       again, I'm thinking about theoreticals, but if the  
16       inmate, you know, didn't seem to go off to sleep and  
17       they did the consciousness check and they gave more  
18       midazolam, I would have to deal with that and say,  
19       okay, did they -- you know, are they going to do a  
20       second consciousness check and so forth.

21                       So these protocols, they're supposed  
22       to make sure that the IV is patent and all that and we  
23       all know about some of the executions that have  
24       occurred where there have been problems with delivery  
25       of the drug. And I've always claimed that in order for

1       those protocols to work in the way that they are  
2       intended, as I understand it, that you have to have a  
3       patent, functioning, properly placed IV.

4               Q.           Are you aware that the individual who  
5       does the consciousness check in Oklahoma is a doctor?

6               A.           I have been told that that individual  
7       is a doctor. I have no idea if they are not. I don't  
8       know who the person is that goes -- that went in there  
9       yesterday, but that's what I've been told.

10              Q.           Do you think having a doctor do the  
11       consciousness check instead of a prison warden is more  
12       appropriate?

13              A.           I will not say whether it's more  
14       appropriate --

15                           MR. ATYIA: Objection to form.

16              A.           -- but I will say that a physician  
17       will have more training in doing consciousness checks  
18       than a warden would.

19              Q.           Let me ask you again, have you  
20       received any texts or e-mails from your counsel today?

21              A.           No. Well, the e-mails were just the  
22       ones where he forwarded those references, but no texts  
23       and I haven't spoken to him.

24                           MR. ATYIA: I've e-mailed him the  
25       exhibits you've given us. If you think that



1 I'm texting with him during this deposition, I  
2 can tell you that's not. Besides sending the  
3 e-mails that you told me to send him and that  
4 you provided, I think nothing else is being  
5 (inaudible), Alex.

6 Q. You testified a minute ago that it's  
7 your opinion that individuals subject to the Tennessee  
8 execution protocol would have midazolam in their blood  
9 at a level of 155,400 nanograms per milliliter. Do you  
10 remember testifying to that?

11 A. I said -- I did that calculation and  
12 that's the number I came up with because Mr. Atyia  
13 asked me to do that calculation. I do not trust that  
14 1,554 number. I need to look at that and look at what  
15 other people have provided or what they have reported  
16 for midazolam concentrations. So that -- all I'm doing  
17 there is -- so you take the peak level, if you get this  
18 peak level at midazolam 5 milligrams and you just  
19 multiply by 100, then that would be your expectation of  
20 what the level would be with 500 milligrams. But that  
21 1,554, that just -- it seems very high. And it just --  
22 in fact, you should go back and talk to Dr. Stevens  
23 about this because he did a similar calculation way  
24 back when and I'm pretty sure he didn't get that high  
25 of a level. I could be wrong. I just don't remember

1 off the top of my head, but I don't think it was that  
2 high.

3 Q. Well, I'm asking you about your  
4 calculation right now about inmates subject to lethal  
5 injection execution. Is that your opinion to a  
6 scientific certainty?

7 A. That that's what the level would be?

8 Q. Yeah, 155,400.

9 A. No, I'm not certain about that,  
10 because I am uncertain about that assumption that 1,554  
11 is the correct number.

12 Q. You also said -- you also told Mr.  
13 Atyia you would go back and review the Greenblat  
14 studies. Do you recall saying that?

15 A. Yes.

16 Q. Do you consider those studies to be  
17 reliable studies?

18 A. In general, yes. So let's just make  
19 sure, you know, we understand each other about  
20 reliability and all that. Every paper that you read, I  
21 shouldn't say every paper, many papers that you read  
22 there can be a mistake made in the way the data are  
23 reported. And in fact, as you know, if you look at my  
24 report, I talk about what I thought was an error in one  
25 of the studies that I cited. And I think they just

1 basically made an error in terms of where the decimal  
2 point went. So those types of errors can happen, and  
3 so I -- that's why I want to go back and take a look  
4 and see what was the peak level, you know, in  
5 Greenblat's study, let's say, or someone -- you know,  
6 some study giving midazolam at about the dose as the  
7 Antonik study and they got a peak level at one minute  
8 of 150 instead of 1,554, it makes me think, hmm, I'm  
9 not sure that they accurately reported that in the  
10 Antonik study, so that's why I want to look at that.

11 Q. That was a study that you were  
12 relying on in your report, right?

13 A. I was relying upon that. I wasn't  
14 relying upon that peak level, but I was relying upon  
15 the other data that I was looking at.

16 Q. Another study you rely on in your  
17 report is Miyake, right?

18 A. Yes.

19 Q. And do you agree that Miyake explains  
20 that midazolam has a ceiling effect?

21 A. I do not remember if they use that  
22 term. They probably do. They reported that the  
23 midazolam going from .2 per kilogram to .3 per  
24 kilogram, they did not detect a change in the effects  
25 on the EEG.

1 Q. Go ahead.

2 A. Yeah, but that is one of the pitfalls  
3 of sort of understanding the ceiling effect, it can't  
4 go -- basically going from .2 to .3, there's only a  
5 50 percent increase in the drug dose, and to adequately  
6 sort of explore or probe where there's a ceiling  
7 effect, you need to have a much broader range of doses.  
8 So, you know, I could show this to you on a graph very  
9 easily about what I -- you know, statistically, you  
10 can't really come to that conclusion, although they  
11 did, and I disagree with them that they conclusively  
12 show a ceiling effect, but, you know, that's --

13 Q. You're aware that in the Miyake  
14 study, the authors concluded when you raise the  
15 midazolam from .2 to .3 milligrams per kilogram, so  
16 that would be from 20 milligrams to 30 kilograms in a  
17 100 kilogram person, that there is no change on the  
18 BIS, right?

19 MR. ATYIA: Hold on. Go ahead and  
20 answer, but --

21 A. That is my recollection, yes, of  
22 the --

23 MR. ATYIA: Alex, I think we may be  
24 coming near -- maybe we're past the time.

25 MR. KURSMAN: You're going to cut me

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1 off right now? You just informed me 20 minutes  
2 ago that Dr. Antognini viewed an execution.

3 MR. ATYIA: Alex, nobody -- I didn't  
4 say I was going to cut you off. What I said is  
5 I think we may be coming up on -- nobody is  
6 trying to take away what you want to do. All  
7 I'm saying is I think we may be coming up on  
8 time.

9 MR. KURSMAN: Yeah --

10 MR. ATYIA: Hold on. It appears to  
11 me, if you're basing that you want more time on  
12 this Oklahoma execution, you're not asking  
13 questions about that. You're going back into  
14 studies we've covered. So what would you like  
15 in terms of time? What would satisfy you at  
16 this point? I would like to ask the court  
17 reporter where we are on time. If you want  
18 more and can articulate a reason, we'll  
19 consider it. I'm just trying have a discussion  
20 with you, that's all.

21 MR. KURSMAN: At this point, I am  
22 going through a study we haven't gone through  
23 yet. I had 30 minutes when you started your  
24 questioning. At the point you started your  
25 questioning is when you disclosed the fact that

1 Dr. Antognini witnessed an execution yesterday.  
2 We learned on the record through Dr. Antognini  
3 that he informed you over a week ago that he  
4 was going to see the execution, and yet, none  
5 of the attorneys from the Attorney General's  
6 Office notified counsel for plaintiffs before  
7 this seven hour deposition.

8 MR. ATYIA: We don't think we  
9 necessarily had a duty to call you, Alex, and  
10 tell you things our expert told us that we had  
11 no control over. But I understand why you want  
12 to explore it. It seems like you're asking  
13 about a study. How much more time would you  
14 like? That's all I want to know. And to see  
15 if we can accommodate you. How much more time  
16 would you like?

17 MR. KURSMAN: For the purposes of  
18 this deposition, I think all I need is 15 more  
19 minutes. But I am certainly going to keep the  
20 deposition open.

21 MR. ATYIA: Okay. Well, I understand  
22 you're going to keep it open. Can we take a  
23 break, can I talk and see -- we have been as  
24 accommodating as we can. Let's take a five to  
25 ten minute break.

1 MR. KURSMAN: Sure.

2 VIDEO OPERATOR: Going off the  
3 record. The time is 6:06.

4 (Brief recess.)

5 VIDEO OPERATOR: Back on the record.  
6 The time is 6:14.

7 MR. ATYIA: Dr. Antognini, if you're  
8 okay with it, we want to go ahead and give them  
9 another 15 minutes that they asked for.

10 THE WITNESS: Yes, that's fine.

11 MR. KURSMAN: Actually, we conferred  
12 as well and we think we actually are entitled  
13 to much more than 15 minutes.

14 MR. ATYIA: Okay. Well, I appreciate  
15 that. You already agreed on the record to a  
16 limited scope. We're expanding that. I'm  
17 happy to hear what more you think you're  
18 entitled to, but I am going to get this on the  
19 record. I understand that you think that we  
20 had some obligation to inform you of an  
21 expert's other activities or what he's doing  
22 with regards to his other employment. We would  
23 disagree with that. But I looked through my  
24 e-mail and I can't find in the few minutes I  
25 looked a record of when we found out that he

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1 would be viewing this Oklahoma execution. I  
2 conferred with my co-counsel and have been told  
3 that it was around Monday, is our best estimate  
4 of when we learned that he had confirmed that.  
5 And I know before I said I learned about this  
6 very recently and I think it was around Monday.  
7 And there may have been mention last week that  
8 it was a positive. That's about all we knew,  
9 Alex. And so, you know, that's just the facts  
10 that I have. To the extent that we agreed to  
11 expand your time, that we've agreed to give you  
12 more time, and then you say now you want more  
13 time, and we said, okay, let us go back and  
14 confer about the 15 minutes. And we said,  
15 okay, we'll give you 15 minutes. And now  
16 you're saying you want more time. What more  
17 than 15 minutes? Because you're talking about  
18 a study you could have asked him at any time  
19 during this deposition. Are there any new  
20 facts you've learned during -- you know, since  
21 he wrote the report. We've been here seven  
22 hours. You know, just like you think we had an  
23 obligation to call you up and tell you  
24 everything we know, you could have asked him  
25 that in the past seven hours. So what do you



1 want, like what would -- I guess, at this  
2 point, what do you think is reasonable that  
3 would satisfy you today?

4 MR. KURSMAN: When I agreed to use  
5 half the time that you used, I had no idea that  
6 you would get from the witness that he viewed  
7 an execution yesterday. And that was the way  
8 that you had provided notice to us that the  
9 witness viewed an execution yesterday. Aside  
10 from being highly inappropriate, it opens up a  
11 lot of avenues for me to explore right now.  
12 Had I known that Monday or Friday, when you  
13 were informed that Dr. Antognini was going to  
14 view the execution, my whole approach to this  
15 deposition may have been entirely different.  
16 Based on this late disclosure, and late is  
17 putting it mildly, I would like to continue  
18 with my deposition. If at some point you want  
19 to cut me off, we can then take that up with  
20 the District Court. But as of now, based on  
21 this late disclosure, I am going to continue  
22 with my deposition as planned.

23 MR. ATYIA: Okay. Well, if we're  
24 conferring, just as you asked me when did this  
25 happen and you're calling that -- us

1 inappropriate, I'm not sure you cited anything  
2 that gives us an obligation to go to the  
3 lengths of your terms. And maybe there is, I  
4 have not looked, but I don't think there is.  
5 And a request to continue after seven hours of  
6 questioning I don't think is fair. If you want  
7 to tell us the time that you think you need, we  
8 will consider it. We thought it was 15  
9 minutes, we're ready to agree to that.

10 MR. KURSMAN: How about I continue  
11 with this study before we went on break, and  
12 after that, I will confer with counsel, with  
13 plaintiff's counsel.

14 MR. ATYIA: Why don't we go off the  
15 record for a second and try to work this out.

16 VIDEO OPERATOR: Going off the  
17 record. The time is 6:19.

18 (Brief recess.)

19 VIDEO OPERATOR: Back on the record.  
20 The time is 6:20.

21 Q. So when we went off the record, Dr.  
22 Antognini, we were talking about the Miyake study.

23 MR. ATYIA: No, that's not what we're  
24 doing, Alex. You're not going to continue in  
25 an unbounded deposition when we've gone past

1           seven hours plus past the time that we  
2           stipulated with you. So we can agree to  
3           continue to produce Dr. Antognini if you are --  
4           you've provided with no request for additional  
5           time. You've provided us no idea of how much  
6           more time you want. You just said you're going  
7           to continue your deposition. If that's your  
8           position, there's nothing we have to work with  
9           and we need to confer with our folks and decide  
10          what to do next. If you have a request for  
11          time that we can consider, we're happy to try  
12          to accommodate that. But it's getting late.  
13          Like I'm supposed to be home right now. It may  
14          snow here. What do you need to do in this  
15          deposition to feel satisfied?

16                   MR. KURSMAN: I apologize that it may  
17                   snow there and you have to be home, but  
18                   unfortunately, you had just told us at hour  
19                   6:30 of this deposition that Dr. Antognini,  
20                   your expert anesthesiologist, witnessed an  
21                   execution with the same three drugs that are  
22                   subject to this execution protocol. Your  
23                   witness, Dr. Antognini, also told us that he  
24                   told you he was going to view that execution  
25                   over a week ago. Neither you nor any of your

1 co-counsel ever informed anyone on plaintiff's  
2 counsel that Dr. Antognini was going to view  
3 this execution. Now at hour 6:30, you tell us  
4 he viewed this execution and complain that  
5 we're going over seven hours. Take your time  
6 and confer with counsel. We are going to  
7 continue this deposition until you tell us we  
8 have to stop.

9 MR. ATYIA: Yeah, this isn't -- I'm  
10 sorry if this isn't productive. We're trying  
11 to accommodate you. If you're just going to  
12 say you're going to continue until you're told  
13 to stop, then I understand. Let me confer with  
14 my counsel and we'll see what we can do.

15 MR. KURSMAN: We can go off the  
16 record.

17 VIDEO OPERATOR: Off the record. The  
18 time is 6:23.

19 (Brief recess.)

20 VIDEO OPERATOR: Back on the record.  
21 The time is 6:32.

22 MR. ATYIA: When we were off the  
23 record, I conferred with my counsel and I asked  
24 Mr. Ely and Ms. Davis if they could devote some  
25 more time to this, so, Dr. Antognini, can you

1 do another hour?

2 THE WITNESS: Yes.

3 MR. ATYIA: Okay. Alex, maybe if you  
4 can try and get this done in an hour, that  
5 would be -- we would really appreciate that.

6 MR. KURSMAN: I think I will actually  
7 be done way shorter than an hour.

8 MR. ATYIA: We're happy to be here  
9 for another hour if you want.

10 MR. KURSMAN: Okay. I will be  
11 leaving the deposition open, though, as well,  
12 just so --

13 MR. ATYIA: Yeah, we understand.  
14 That's something you can do unilaterally.

15 MR. KURSMAN: Okay. Now, are we back  
16 on the record?

17 Q. So we were talking about Miyake, but  
18 before we get there, I want to go back to the execution  
19 you witnessed yesterday. Where did you witness the  
20 execution?

21 A. You mean where I was sitting or where  
22 the city?

23 Q. Oh, no, I apologize. Where were you  
24 seated in the --

25 A. Okay. The witness room that I was --

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1 I guess it's two witness rooms, but the one that I was  
2 in, which is the one that's directly adjacent to the  
3 chamber, there are two rows of ten seats. And I was in  
4 the second row, fourth seat from the right. And then  
5 if you look at the window, observation window if you  
6 want to call it that, there's actually two of them, two  
7 large observation windows with basically a frame in  
8 between. And I was basically about -- my field of --  
9 or where my head would be located, you know, relative  
10 to the window about one foot to the left of the  
11 beginning of the window, basically. So I had a clear  
12 view of the inmate's body and head and so forth, so  
13 I -- and I'm probably about 15 approximately, you know,  
14 based on my guestimate, about 15 feet away from the  
15 inmate, would be my guess.

16 Q. Who else was in the viewing area with  
17 you?

18 A. So when we went in, there were  
19 already probably maybe ten people, I'm guessing, in the  
20 room. And I don't know who those people were. Just  
21 sort of, you know, looking around, it seemed like some  
22 of them were probably from the -- reporters. And there  
23 were some individuals in the front, I'm guessing, were  
24 witnesses on behalf of the inmate. I'm not positive  
25 about that, but just based on the fact that the -- when

1 the inmate was making a statement and he was looking at  
2 those individuals and then later on, they were -- the  
3 individuals were crying, I assumed that they were  
4 witnesses on behalf of the inmate.

5 And there was a -- a couple of  
6 people, of course, I -- there were a couple of people  
7 in front of me. I don't know who they were. And then  
8 the people that came in with me were -- there were  
9 two -- the prosecuting attorneys for the case, the  
10 original prosecuting attorneys is what they were -- who  
11 they said they were. There was a gentleman who was  
12 the -- he gave his title as a -- he said he was an  
13 investigator for the Oklahoma Highway Patrol. There  
14 was a woman who was the -- she said she was like a  
15 secretary in the Governor's cabinet related to public  
16 relations. I don't really know exactly. Her first  
17 name was Trish. You know, I don't what her full name  
18 is, you know, if that's just a nickname, but it's  
19 Trish.

20 The people that came in with me, I  
21 feel like I'm missing somebody. I got -- I said the  
22 investigator for the Highway Patrol, there were the two  
23 prosecuting attorneys, there was -- oh, there was  
24 somebody else, a man who, you know, he introduced  
25 himself and said who he was and what he did, but I

1 forget exactly what it was. I think he was -- oh, my,  
2 let's see. His role was -- I think, you know,  
3 something in law enforcement. I forget exactly what it  
4 was. He was a -- I think he said he was a former  
5 police chief, but I don't know what his role here was,  
6 I forget exactly. The only name that I remember is  
7 Trish.

8 Q. Was there a -- you said you were in  
9 the second row, so was a person in front of you in the  
10 first row?

11 A. There was a person in front of me,  
12 yes. But we're elevated, the seats are elevated in the  
13 second row, so they don't -- it doesn't obstruct your  
14 view, at least to my recollection it's elevated. I did  
15 not have an obstructed view based on that.

16 Q. Was anyone standing?

17 A. There was -- in the witness room?

18 Q. Yes.

19 A. Off to the -- and I forgot to mention  
20 this, off to the -- my far right in a small room was a  
21 person from the Department of Corrections. I don't  
22 think -- when we first got ushered in, there were two  
23 people from the Department of Corrections and one of  
24 them gave their explicit instructions, which basically  
25 said -- he said, you must be quiet. If you say



1 anything, you'll be escorted out of the room. You  
2 can't talk to anybody in the room.

3 So we entered the room at around  
4 9:41, so it was basically about 20 minutes of just  
5 sitting there quietly. In any case, that gentleman --  
6 the gentleman that gave those instructions, I don't  
7 think he stayed in the room. There was another person  
8 from the -- I presume from the Department of  
9 Corrections who stood off to the side and I think he's  
10 the one that was making sure that if anyone talked, he  
11 would, you know, remove you if you did. If somebody  
12 did something that they shouldn't have, he was the one  
13 that was going to, you know, enforce the rules. There  
14 might have been the other gentleman there, but I didn't  
15 want to look around too much because I was afraid I  
16 might get kicked out of the room for doing something I  
17 shouldn't.

18 Q. And did you have any conversations  
19 with anybody who was in that room?

20 A. In the room?

21 Q. Not while you were in the room. I  
22 assume you didn't have any conversations while you were  
23 in the room.

24 A. No. No, we did not.

25 Q. Did you have any conversations

1 with --

2 A. Well, just to be absolutely clear  
3 about that, when we first entered the room, the -- one  
4 of the gentlemen, one of the people from the Department  
5 of Corrections said to me, you sit over there. And  
6 there was a Kleenex box on the chair. But the two  
7 prosecuting attorneys were going to sit next -- it  
8 looked like they were going to sit next to each other,  
9 so there was a little bit of a mixup about where I was  
10 supposed to sit and so we had a conversation about, you  
11 know, where I'm supposed to sit, but that was basically  
12 it.

13 Q. How did that conversation go?

14 A. Well, when this person from the  
15 Department of Corrections said to me you're supposed to  
16 sit over there, I think he said where that box is, I  
17 forget exactly his words, but he meant to imply where  
18 the Kleenex box was and that's why it was there. But  
19 during that process, the two prosecuting attorneys had  
20 already -- were already going down that row and they  
21 moved the box because they were going to, I guess, be  
22 -- were going to sit together, but they didn't hear  
23 that conversation. They didn't know that that was  
24 where I was supposed to sit, so I had to go to the  
25 person from the Department of Corrections there and I

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1 said, where do you want me to sit? You know, again, we  
2 just sort of worked out that I was supposed -- I was  
3 still confused, you know. I said to him, is this the  
4 chair that you want me -- that I'm supposed to be  
5 sitting in? He said yes. So that's how that all went  
6 out.

7 Q. Were the prosecuting attorneys aware  
8 that you are an expert for the State of Oklahoma in the  
9 lethal injection challenge?

10 A. Yes. While we were waiting in  
11 another part of the prison, you know, those people that  
12 were going to be witnesses as far as that is concerned,  
13 you know, some of these people that I just talked  
14 about, we just had discussions about, you know,  
15 introducing ourselves and so forth, so I told them that  
16 I am an expert witness for Oklahoma and I came to  
17 observe the execution.

18 Q. And did they say, okay, then sit with  
19 us?

20 A. No. The seat that was chosen for me  
21 was one that was worked out with the attorneys from the  
22 Attorney General's Office.

23 Q. And how was that seat chosen?

24 A. They just felt that that would be the  
25 best place to view, you know, what was going on in the

1 chamber.

2 Q. Why would the second row be a better  
3 view than the first row?

4 A. I believe it was because they -- not  
5 to get -- I don't think it's detailed -- I guess they  
6 do kind of go into attorney-client privilege, but I  
7 think that there -- you know, the first row -- I am not  
8 sure about this, and maybe you should ask them, but it  
9 sounds like the first row is supposed to be for the  
10 witnesses for the inmate and all the seats were going  
11 to be occupied except for the ones that are at the very  
12 end, which would not have given perhaps as good a view  
13 as the one that I was sitting in. That's my guess.

14 Q. After the execution, did you have any  
15 conversations with the prosecuting attorneys?

16 A. No. No, I did not have any  
17 discussions. So when we were being transported -- so  
18 we were transported in a van, you know, from basically  
19 the warden's office area or building to the building  
20 where this occurred. And then we were transported in a  
21 van coming back. They were talking, people were  
22 talking, but I stayed silent. I did not have a  
23 conversation with them.

24 Q. Did anybody ask you what your  
25 thoughts were on the execution as an anesthesiologist?

1           A.           The only person that had a question  
2     about what I observed, and let me give you the context  
3     here. Before the execution, the person who was the  
4     investigator from the Oklahoma Department, you know,  
5     Highway Patrol asked me about, you know, can you tell  
6     when these drugs are going in through an IV? And I  
7     said, it kind of depends on what you can -- you know,  
8     how close you are. And I'm talking about my clinical  
9     experience here. How close you are and what's going  
10    on. You might be able to see small bubbles going in.  
11    And if you're really close, you could observe, even  
12    without bubbles, you could see basically fluid flowing  
13    in. It's different -- because of what we call a change  
14    in the refraction basically or the way the light is  
15    transmitted, you can kind of see that way. But that's  
16    more difficult to observe because, you know, I don't  
17    know, looking at this when these drugs are being  
18    injected. And we had that conversation before the  
19    execution.

20                   And then after the execution, he just  
21    asked me, well, did you see those drugs going in? I  
22    just said, I saw bubbles at one point going in, which I  
23    think I testified earlier to you. If I didn't, then,  
24    you know, towards the end I saw bubbles in the IV going  
25    in, and I just said that to him. And I have no idea if

1       that means it was being injected or not, but that's  
2       just what I observed.

3               Q.           And could you see the IV point of  
4       entry in the inmate?

5               A.           On the left arm I could. On the  
6       right arm I had to use the computer -- the screen, so  
7       video screen to see that because, you know, the camera  
8       is over the inmate. I can't see the right arm  
9       directly.

10              Q.           From your position, could you see the  
11      inmate's eyes?

12              A.           Yes.

13              Q.           And could you see whether they were  
14      tearing?

15              A.           I did not see that. Could I have  
16      seen that? Yes, I -- if they had a small number of  
17      tears, I could have missed it.

18              Q.           Could you see the inmate's right arm?

19              A.           Only by the video stream.

20              Q.           What about the inmate's right leg?

21              A.           I would -- so the -- in the chamber  
22      itself, if you think about the room being sort of a  
23      rectangle and the inmate was basically to my -- you  
24      know, the head was on the right side of that room as  
25      I'm looking at the room, and the legs are on the left

1 side of the room as you look at that room, there was  
2 the individual from the -- presumably from the  
3 Department of Corrections. He's the one that read the  
4 warrant and so forth. He was standing at the legs  
5 basically near the knee essentially of the -- where the  
6 inmate was on that table. He obscured not all of the  
7 inmate's legs, but some of it. I could see the feet,  
8 although the inmate was covered with a sheet. I could  
9 see the feet -- obviously, I couldn't see the feet  
10 because they were covered by the sheet and I could see  
11 the protrusions basically. So I -- that's what I saw  
12 in terms of the legs.

13 Q. And during your testimony earlier,  
14 you also discussed a different execution that wasn't in  
15 your expert report and that was the execution of, I  
16 believe, John Grant?

17 A. Correct.

18 Q. And in that execution, I think you  
19 testified that he repeatedly vomited during the  
20 midazolam induction, right?

21 A. I do not know that I used the term  
22 repeatedly vomited. I think I said there were reports  
23 that he vomited. But I think that regurgitation is  
24 probably a better term. I mean, I wasn't there, so I  
25 can't say for sure what happened. But he either -- you

1 know, gastric contents came out, let's put it that way,  
2 whether that was the result of regurgitation, you know,  
3 passive regurgitation, or active vomiting, I guess is a  
4 point of contention, I suppose, but that's my  
5 understanding of what happened.

6 Q. And then were there also reports of  
7 heaving, do you know?

8 A. I don't know for sure if I recall  
9 that. I think that was some of the -- you know, a word  
10 that was used in some of the news reports. But I don't  
11 know -- again, I wasn't there, but that word was  
12 probably was used, you know, possibly. I guess I can't  
13 tell you for sure.

14 Q. Did you go into the execution  
15 yesterday hoping to see anything?

16 A. I was going there as a -- almost as a  
17 scientist just to, you know, make observations and  
18 write them down. I wasn't hoping to see one thing or  
19 another. I was just trying to observe -- you know,  
20 write down what I observed.

21 Q. But somehow you did not observe  
22 tears, no reporters observed tears?

23 A. I did not see that, no.

24 Q. And you were being paid something  
25 like \$7,000.00 by the Attorney General's to witness the



1 execution?

2 A. Again, I don't know what the  
3 dollar amount will turn out to be. But based on the  
4 contract, it might be. I don't know if it's going to  
5 be \$7,000.00. I don't remember exactly. Again, it  
6 wasn't part of the contract, so -- but you're not far  
7 off, I imagine, what the amount would be.

8 Q. And witnessing --

9 MR. ATYIA: We didn't pay for that.

10 MR. KURSMAN: Yeah. Just so the  
11 record is clear, I'm talking about the Oklahoma  
12 Attorney General's.

13 MR. ATYIA: Oh, yeah, okay.

14 Q. And that is in anticipation of a --  
15 for a trial at the end of February; is that right?

16 A. Yes. Well, I don't know what's going  
17 to happen with that information. I'm fully willing to  
18 say to my -- you know, what is blatantly obvious is  
19 that, you know, do I have a conflict of interest. You  
20 know, here I am making these recommendations and I'm  
21 also observing executions. Am I going to, you know,  
22 fudge the data, so to speak. I'm not going to fudge  
23 the data. I'm going to report it just basically the  
24 way I did it. And as I said to you very early on  
25 about -- when you asked about this, if I never heard --

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1 got another call from any state or anybody else about  
2 doing this work, I would be happy.

3 Q. Let's go back for a second. You just  
4 said do I have a conflict of interest. Do you have a  
5 conflict of interest?

6 A. Well, a conflict of interest is one  
7 of those things where basically you have to ask  
8 yourself, you know, how would this be perceived. So in  
9 one sense, someone might perceive that, you know, my  
10 participation in that way as a conflict of interest.  
11 But you know, all I can tell you is that I would report  
12 the data.

13 Q. If you were authoring a paper on that  
14 execution that you observed yesterday, would you have  
15 to note that you had a conflict of interest?

16 A. What you would note is that -- you  
17 know, so if I did a study that was -- I got support for  
18 on the basis of a -- you know, like a drug company,  
19 then you would have to report that, you know, you've  
20 received support for that. It's not necessarily called  
21 a -- you know, you don't have to say, hey, there's a  
22 conflict of interest here. An editor would have to  
23 make a decision about whether that conflict is  
24 sufficient to cause -- you know, cause the data to be  
25 suspect. And likewise here, I'm going to write out an

1 affidavit and then the legal system, whether it's the  
2 Judge or whatever, can decide what the -- you know, if  
3 there's a conflict of interest or not. That's up to  
4 the Judge to decide that.

5 Q. If you wrote a case study about the  
6 single execution you observed yesterday, would you  
7 think it's appropriate that a conflict of interest  
8 statement was appropriate in that case study that you  
9 were acting on behalf of the Oklahoma Attorney  
10 General's as an expert in the lethal injection trial  
11 and that you were paid approximately \$7,000.00 to view  
12 the execution?

13 A. Well, I think what would be  
14 appropriate is in my affidavit is to make that  
15 statement, a statement such as that, was that, you  
16 know, I received X number of dollars or I received  
17 compensation for this.

18 Q. I'm not asking you about your  
19 affidavit. I'm asking if you were to write a case  
20 study on this report, like many of these studies that  
21 we've been looking at for the last seven hours, would  
22 you have to disclose that you had a conflict of  
23 interest?

24 A. I think I've answered that question.  
25 I would say, yes, you have to fill out, eventually, a

1 conflict of interest form or a set of questions that  
2 are then handled by the editor to decide, you know,  
3 what kind of statement you should make in the paper.  
4 And maybe the editor says, you know what? There's too  
5 much of a conflict here. And I'm talking  
6 hypothetically, because, you know, I'm not going to --  
7 you're not going to write a case report on an execution  
8 and try to get it published. So it's a little bit of  
9 a -- you know, it's not a little bit, it's a  
10 hypothetical. I mean, no one would ever do that, so --

11 Q. Well, some of the studies that you  
12 cite in your report, aren't they based on single  
13 patient case studies?

14 A. Yes, but not an execution. I mean,  
15 that's -- that is a -- it's not the type of thing that  
16 you would report as a case report. It's just -- it  
17 isn't. So I don't -- again, it's sort of a  
18 hypothetical that I'm not sure would exist, but if  
19 there was a journal out there that for some reason  
20 would be interested in this -- in a case report and I  
21 had an interest to write it up, which I don't, then,  
22 yes, I would have to report that -- or should report  
23 that I have been compensated for that. But I don't see  
24 that as a -- you know, compensation in things like this  
25 come up all the time and the important thing is that

1       you be honest about it and you put it up front and let  
2       other people decide whether or not there's a conflict  
3       or how much -- how trustworthy you are in terms of your  
4       reporting of the data.

5               Q.           Would you be willing to view another  
6       execution?

7               A.           Yes, I think that at this point in  
8       time, I would be. But I wouldn't want to make a -- you  
9       know, a business out of it by any means. I certainly  
10      don't need the money and I don't need the -- I just  
11      don't need it. I mean, it just -- yeah, I'm not -- you  
12      know, I probably would, but I'm not going to be looking  
13      for it.

14              Q.           Are you planning on viewing another  
15      execution?

16              A.           No, there are no -- I have not been  
17      contacted by anyone and I'm not out there looking for  
18      it. And as I said earlier, when I was first contacted  
19      by Oklahoma, I said, you know, I just don't think this  
20      is, you know, something I want to do. You know, the  
21      schedule is too much of a problem for me and I'm not  
22      sure that I really want to see an execution. At one  
23      point in my -- you know, someone asked me that  
24      question, I think my answer was, I've never see an  
25      execution and I hope that I never do. But again, I

1 think one of the important issues if I decide to do it  
2 is just because I wanted to be able to say to myself  
3 that if I'm going to be part of a process that ends in  
4 this, this is the end result, I probably should see  
5 exactly what -- how this works, and that was another  
6 reason why I decided to do it.

7 Q. Would you be willing to serve as an  
8 expert in a future lethal injection case?

9 A. I would be willing to do that for the  
10 state or for an inmate. If an inmate -- you know, I  
11 know plaintiffs or inmates -- or attorneys for inmates  
12 might not look at me as being perhaps a, you know, good  
13 choice for them. But if they thought for some reason  
14 that I could help them, then I would be willing to do  
15 that. I mean, I don't have any problems with, you  
16 know -- it's not like I -- you know, I don't have any  
17 problems working with inmates' attorneys and testifying  
18 on behalf of inmates. If, you know, they felt my  
19 testimony would be helpful to them, I would do that.

20 Q. Okay. Let's go back to the Miyake  
21 study that we were discussing before. We were talking  
22 about when we cut off you said you were aware of how  
23 the Miyake study showed that at .2 milligrams per  
24 kilogram and .3 milligrams per kilogram there is no  
25 change on the BIS. Do you recall that?

1 A. I do, yes.

2 Q. So if we have a 100 kilogram person  
3 who received 20 milligrams or 30 milligrams, these  
4 authors are saying there would be no change in the BIS,  
5 right?

6 A. That's what the data suggested, yes.  
7 You know, that's what they reported and that was the  
8 conclusion, that there was no change between using .2  
9 to .3.

10 Q. And that's raising the dose  
11 50 percent, right?

12 A. Yes.

13 Q. And do you recall -- I can pull it  
14 up, but do you recall that they said the maximum effect  
15 of midazolam on the BIS is approximately 70?

16 A. And this is in the Miyake study?

17 Q. This is the Miyake study, yeah.

18 A. We'll have to pull that study up  
19 because I don't think it was -- I think it was below  
20 that. I believe that the BIS levels were in the low  
21 60's.

22 Q. Well, what if the Miyake study said  
23 the maximum effect of midazolam on the BIS is  
24 approximately 70, would that change your opinion today?

25 A. No, not really. Again, you're

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1 looking at a dose response. The reported -- they were  
2 looking for the dose response, but using that as  
3 evidence that there's a ceiling effect, you just cannot  
4 determine a ceiling effect on the basis of doses that  
5 are close apart or close together.

6 Q. Miyake is an article that you cited  
7 in your report, right? Let's pull up Miyake. Do you  
8 have Miyake?

9 A. Yeah, I do.

10 Q. I'll share my screen as well.

11 A. Okay. Miyake. Miyake. Oops,  
12 something happened here. Something happened.

13 Q. Well, I can just show you on my  
14 screen if you know the --

15 A. I have it here. So go ahead, I have  
16 it here.

17 Q. Okay. So do you see where I am right  
18 here? It says, these results are consistent with those  
19 reported earlier showing that BIS decreased only to 70  
20 by the end of continuous infusion for ten minutes and  
21 that the maximum effect of midazolam on the BIS is  
22 approximately 70. Do you see that?

23 A. Yes.

24 Q. Okay. And you know that, as you said  
25 before, 70, the BIS reading for general anesthesia,



1 right?

2 A. All right. So let's now go to -- it  
3 might be the page before that, 389. Oh, no. I'm  
4 sorry. I'm sorry. No, it's right there, so -- no,  
5 scroll up a little bit. No, it's right there. That's  
6 fine. So if you look at the figure A -- I'm sorry,  
7 what figure is that? It's figure -- yes, correct.

8 MR. KURSMAN: And let's mark this as  
9 EXHIBIT 14.

10 (Thereupon, the Miyake study was  
11 marked and filed as EXHIBIT 14.)

12 A. So you see, first off, the BIS -- the  
13 dots are closer to 60 there. And then if you go into  
14 the actual results section, I believe, we're going to  
15 see this in two different spots, but if you go into  
16 results, so scroll up. All right. I'm not sure I'm  
17 going to be able to find it, you're going to be able to  
18 find it, so let me pull it up on my screen here.

19 Q. So while you're doing that, let me  
20 ask you this: Are you saying the authors are wrong  
21 when they say these results are consistent with those  
22 reported earlier showing that the BIS decreased only to  
23 70?

24 A. Okay. Hold on.

25 Q. Did you hear my question?

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1                   A.           I did hear your question and you  
2                   asked me do I think they're wrong. Well, what I am  
3                   saying is that the -- I don't think that they report  
4                   their data -- or I need to take a closer look at what  
5                   you're -- all right. So first off, let's go to page --  
6                   it would be their page 392.

7                   Q.           Okay.

8                   A.           And this is the paragraph that's  
9                   beginning at the very bottom. It says, there are  
10                  several limitations to our study and they're talking  
11                  about remifentanil and then they write, in our  
12                  preliminary study, the BIS was 96 and then it went down  
13                  to 64, 60, 64, and 64 at the five, ten, 15, and 20  
14                  minute intervals respectively. So in that preliminary  
15                  study, they went down to the low 60's. And then if you  
16                  go to -- all right. Pardon me for a moment here.  
17                  Let's see if I can find it here. If we go to -- okay.  
18                  So I think it's -- probably I'm going to be focused now  
19                  on that figure there, figure 2-A.

20                  Q.           What page are you on?

21                  A.           I'm on page 390, which is figure 2-A.  
22                  You can see that the -- and the open circles are the  
23                  large dose group. You can see that the open circles  
24                  there on figure 2-A, the open circles at time points of  
25                  around maybe five minutes. I'm not sure, you know,

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1       it's basically perhaps five minutes all the way to  
2       about 15 minutes are around 60 or -- are around 60,  
3       maybe in the low 60's. And I'm talking again about the  
4       open circles, not the filled one, because -- or the  
5       .3 milligrams. So at that point for that 15 minute  
6       period, the BIS is around, you know, 60 or the low  
7       60's. And then when you get down to 30, 45, and 60  
8       minutes, then it starts to go up to around 70. So  
9       maybe that's where they get their 70 from. But, you  
10      know, during the time period that is important as far  
11      as our discussion is concerned, it's in the low 60's.

12               Q.           So let me ask my question again. So  
13      do you believe the authors are wrong when they say the  
14      results are consistent with those reported earlier  
15      showing that the BIS decreased only to 70?

16               A.           I believe -- I believe that what they  
17      are -- so let's -- when they talk about that -- when  
18      you have that sentence, they refer to reference 9 and  
19      reference 6. So if you go to reference 6 and reference  
20      9, I think those -- that 70 number is -- they're  
21      referring to those other papers, not to their own  
22      study.

23               Q.           Do you see that they say these are --

24                           MR. ATYIA: Does Dr. Antognini have a  
25      copy of this study or --

1 THE WITNESS: I have it in front of  
2 me.

3 MR. ATYIA: Okay.

4 A. I don't have -- I might -- I think I  
5 do have the reference studies, but I also have the  
6 Miyake study in front of me.

7 Q. Are you saying that the -- and then  
8 they say, and the maximum effect of midazolam on the  
9 BIS is approximately 70. Do you see that? I've got it  
10 highlighted.

11 A. Yes, I see it.

12 Q. Do you disagree with the authors  
13 about that statement?

14 A. I actually would disagree with that  
15 because their own data shows that it goes down to 60,  
16 in the low 60's, and they report -- I showed you where  
17 they reported that. And they said approximately 70,  
18 so, you know, these are Japanese authors that are  
19 writing in English and there may have been something  
20 lost in translation there, so -- I just -- you know, I  
21 don't agree with your interpretation of that sentence.  
22 And I don't -- I believe, I think that the authors  
23 probably didn't mean to imply that their data show that  
24 the lowest value was 70, because the data show  
25 otherwise.

1           Q.           It actually says in the discussion,  
2           the maximum effect of midazolam on the BIS is  
3           approximately 70. And this is an article that you're  
4           citing in your report and now you're saying you  
5           disagree with the authors; am I right?

6                       MR. ATYIA: Objection, form.

7           A.           I disagree with that sentence and how  
8           you are interpreting it.

9           Q.           It says, these findings suggest that  
10          BIS does not decrease further even if its plasma  
11          concentration increases the level -- levels higher than  
12          that required for sedation. Do you disagree with that  
13          statement?

14          A.           I don't. But focus on the word  
15          suggest. It doesn't prove it, it just suggests. And  
16          again, you have to look at the methodology and I've  
17          already -- you know, ad nauseam gone over the  
18          methodology that you can't -- you may not see much of  
19          an effect, a change with just a 50 percent increase in  
20          the dose.

21          Q.           So what these findings are suggesting  
22          for layman's terms, like what these findings are  
23          suggesting is a ceiling effect at .2 milligrams per  
24          kilogram, right?

25          A.           You can use the word suggest if you

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1 want. You know --

2 Q. They're using the word, not me.

3 A. Yeah. Well, actually -- I'm sorry,  
4 you probably -- do they actually use the words ceiling  
5 effect here?

6 Q. No, they say -- I'm just talking  
7 about the term suggests.

8 A. Yeah. Okay. Well, sometimes when we  
9 write things in the science literature and this happens  
10 elsewhere I'm sure, but we will use words like suggest  
11 and so forth. Usually that means that, you know,  
12 there's a trend there. You know, it's not reached  
13 statistical significance and you can't hang your hat on  
14 it.

15 Q. But this is an article that you're  
16 citing in your report.

17 A. Yeah, I do that. So if you want to  
18 keep on talking, I just realized now it's getting  
19 pretty dark and my room is -- so I'm going to turn a  
20 light on real quick. It's taking me a second here.  
21 Hold on. I don't know whether or not you want to see  
22 more of me or not, but there it is. The light is back  
23 on.

24 Q. I'm happy to go until midnight.

25 A. Hopefully not midnight my time.

1 Q. And in Miyake, there were no  
2 consciousness checks, right?

3 A. There were not, as I recall, because  
4 they gave the midazolam followed by -- they gave  
5 remifentanyl as I discussed. And then that, of course,  
6 wears off and then they gave vecuronium. Now, as you  
7 know, my -- one of my takes from this paper is that  
8 these patients were intubated, which is stimulating.  
9 They were left with a tracheal in place there for up to  
10 60 minutes and they, you know, didn't see much of a  
11 change over that period of time. So that's pretty  
12 telling as well. One dose of midazolam kept them at  
13 that level for that long.

14 Q. They're intubated, they're paralyzed,  
15 right?

16 A. Correct.

17 Q. So let's go to -- so what they're  
18 talking about here is, do you see it says .3 milligrams  
19 per kilogram isn't that -- doesn't change -- it goes  
20 from .2 milligrams per kilogram to .3 milligrams per  
21 kilogram, there's no (inaudible) of the BIS, right?  
22 That's what they're saying. And they're saying that  
23 the BIS remains over 70. So, let's now go to --

24 A. I'm not going to agree to that, you  
25 know, interpretation of that sentence. But you know,

1 if you want to keep on beating this dead horse, that's  
2 fine, but I don't agree with that interpretation.

3 MR. ATYIA: Alex, I know you wanted  
4 to make sure we stayed on the record rather  
5 than going off the record. It seems like  
6 you're outside the Oklahoma execution that you  
7 felt was late disclosed or undisclosed or --  
8 and it looks we're -- you know, I'm here as  
9 long as you want to be, but is there a limit to  
10 what you're planning to do?

11 MR. KURSMAN: There is a limit. I am  
12 outside the scope of the Oklahoma execution at  
13 this point.

14 MR. ATYIA: Is there a reason you  
15 couldn't have asked these questions during  
16 the -- about this study during the seven hours?

17 MR. KURSMAN: Yes. So I was planning  
18 on it and then I stopped at 6:30 to give you  
19 some time to ask questions on direct, and when  
20 you asked those questions and disclosed that he  
21 witnessed an execution yesterday, that opened  
22 up a whole different line of questions for me  
23 than what I was --

24 MR. ATYIA: Understood. I just want  
25 to understand --



1 MR. KURSMAN: All I have is a few  
2 more questions. I'll be done very shortly.

3 MR. ATYIA: I don't want to rush you.  
4 Take your time.

5 Q. So if we go back to your report,  
6 let's go to paragraph 29 of your report. Do you have  
7 your report or do you want me to share it?

8 A. No, I have it here. So paragraph 29,  
9 all right. Let me go to paragraph 29. Let me just  
10 catch up to you here. Yes, I have it here.

11 Q. Okay. So do you -- at the very  
12 bottom, you see, the answer in my opinion to a  
13 reasonable medical and scientific certainty is that  
14 midazolam administered to persons at .3 to .4  
15 milligrams per kilogram produces unconsciousness, blunt  
16 response to noxious stimuli, reduces awareness of pain  
17 such that these persons don't experience any more pain  
18 than persons anesthetized with other anesthetics such a  
19 thiopental, propofol, and isoflurane. Do you see that?

20 A. Yeah. You got a few of the words  
21 off, but that's fine. You put it pretty closely.

22 Q. Okay. Is it still your opinion that  
23 at .3 milligrams per kilogram persons don't experience  
24 any more pain than those anesthetized with anesthetics  
25 such as thiopental, propofol, or isoflurane?

1           A.           Yes, it is. Again, you know, based  
2           on my -- the definition of pain that I have used and  
3           that we've gone over, basically I would say that giving  
4           someone .3 milligrams per kilogram of midazolam or  
5           giving them propofol as an induction dose, you're going  
6           to have no pain in either case.

7           Q.           I'm not talking about as an induction  
8           dose. I'm talking about .3 milligrams per kilogram of  
9           midazolam, is that as sufficient to ensure a person  
10          doesn't experience pain as those persons anesthetized  
11          with other anesthetics such as thiopental, propofol, or  
12          isoflurane? It's just a yes or no answer.

13          A.           Yeah, I would say, yes, they have  
14          similar amounts of -- well, I won't say similar amounts  
15          of pain because I would say they both have -- you know,  
16          there's no pain.

17                       MR. KURSMAN: Could we go off the  
18                       record for a few minutes?

19                       VIDEO OPERATOR: We're off the  
20                       record. The time is 7:16.

21                       (Brief recess.)

22                       VIDEO OPERATOR: Back on the record.  
23                       The time is 7:24.

24                       MR. KURSMAN: I have no further  
25                       questions. I will -- I believe we entered 14

1 exhibits, which I will e-mail to the court  
2 reporter and to the counsel for defendants as  
3 well.

4 VIDEO OPERATOR: Anything further?

5 MR. KURSMAN: Not from plaintiff's  
6 counsel.

7 MR. ATYIA: Alex, if you need us to  
8 work with you on something, please reach out.

9 MR. KURSMAN: I appreciate that.

10 MR. ATYIA: We're happy to work with  
11 you.

12 MR. KURSMAN: I appreciate that.  
13 Have a good weekend everybody.

14 MR. ATYIA: You, too. Thanks  
15 everybody. Thanks Dr. Antognini.

16 VIDEO OPERATOR: Stand by. This  
17 concludes the video deposition. The time is  
18 7:24. Going off the record.

19 (FURTHER THE DEPONENT SAITH NOT.)  
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C E R T I F I C A T E

STATE OF TENNESSEE )  
COUNTY OF KNOX )

I, Missy Davis, LCR #356, Licensed  
Court Reporter in and for the State of Tennessee, do  
hereby certify that the above Transcript of Proceedings  
was reported by me, and that the foregoing (346) pages  
of the transcript are a true and accurate record to the  
best of my knowledge, skills, and ability.

I further certify that I am not  
related to nor employee of counsel or any of the  
parties to the action, nor am I in any way financially  
interested in the outcome of this case.

I further certify that I am duly  
licensed by the Tennessee Board of Court Reporting as a  
Licensed Court Reporter as evidenced by the LCR number  
and date following my name below.

A handwritten signature in black ink that reads "Missy Davis". The signature is written in a cursive, flowing style. It is positioned above a light blue horizontal line.

Missy Davis, LCR #356  
Expiration Date: 6/30/22

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[relatively - respiratory]

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[respiratory - right]

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Tennessee Rules of Civil Procedure  
Depositions Upon Oral Examination  
Rule 30

Rule 30.05: Submission to Witness; Changes;  
Signing.

When the testimony is fully transcribed the deposition shall be submitted to the witness for examination and shall be read to or by the witness, unless such examination and reading are waived by the witness and by the parties. Any changes in form or substance which the witness desires to make shall be entered upon the deposition by the officer with a statement of the reasons given by the witness for making them. The deposition shall then be signed by the witness, unless the parties by stipulation waive the signing or the witness is ill or cannot be found or refuses to sign. If the deposition is not signed by the witness within 30 days of its submission, the officer shall sign it and state on the record the fact of the waiver or of the illness or absence of the witness or the fact of the refusal to sign together with the reason, if any, given therefor; and the deposition



may then be used as fully as though signed unless on a motion to suppress under Rule 32.04(4) the court holds that the reasons given for the refusal to sign require rejection of the deposition in whole or in part.

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